From Unemployment to Sustainable Livelihoods in Ottawa’s Technology Sector

Ging Wong

A Case Study of Local Skills Strategy for the OECD / LEED Program
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Preface

Since submission of the draft report to the OECD-LEED Program on 30 June 2007, a unique seven-years retrospective study of the unemployed high technology workers was released by Statistics Canada. Drawing upon Statistics Canada's confidential Longitudinal Worker File – itself constructed from four administrative data sources that linked Records of Employment and tax filer information by the Social Insurance Number and firm-level data by a company identifier – this study was able to identify and trace the re-employment of those permanently laid off in the high-tech industry by location. The findings are stunning.

The findings suggest that the high-tech downturn resulted in a sudden and dramatic increase in the probability of experiencing a permanent layoff, which quadrupled in the manufacturing sector from 2000 to 2001. Ottawa-Gatineau workers in the industry were hit particularly hard on this front, as the permanent layoff rate rose by a factor of 11 from 2000 to 2001 [1.5% to 16.0%]. Moreover, laid-off manufacturing high-tech workers who found a new job saw a very steep decline in earnings [$11,700 from 2000 to 2003]. This decline in earnings was well above the declines registered among any other groups of laid-off workers, including workers who were laid off during the ‘jobless recovery’ of the 1990s. Among laid-off high-tech workers who found a new job, about four out of five did not locate employment in high-tech, and about one out of three moved to another city. In Ottawa-Gatineau, about two in five laid-off high-tech workers left the city.²

For Ottawa-Gatineau, workers in the high-tech sector experienced a 16% permanent layoff rate, 40% of laid-off workers have had to leave the city, and 90% of those who managed to find re-employment did not find jobs in high-tech and suffered very steep earnings losses. This grim story has no parallels relative to other industries and recent time periods.

It is also a particular story of immigrant economic assimilation that changed markedly in the late 1990’s and 2000’s. Since the late 1990’s, entering immigrants to Canada had higher education, were in greater numbers in the skilled worker rather than family immigrant categories, with a growing concentration of IT professionals and engineers. Given these changes in immigrant characteristics and a relatively strong economy, the aggregate entry level earning of all immigrants rose by $5,800 between 1997-2000. This was mainly driven by a rise
in the share of the higher paid immigrant IT professionals and engineers. Between 1995-2000, more engineers and computer scientists were provided by immigration than Canadian universities. However, the earnings picture changed dramatically in the years 2000-2004 during the high-tech crash. Aggregate entry level earnings declined $4,700, driven primarily by falling average earnings among those higher paid workers. In short, the rise and fall of immigrant mean earnings during this period reflected the employment prospects of this particular immigrant occupational group.³

These new facts stand in sharp contrast to the commonplace view that high-tech workers are somehow undeserving of attention and assistance, by virtue of their higher education, professional certification and experience. The reality is that traditional public employment services and programs are designed to assist industrial and service workers to secure skills and jobs requiring less formal education and training. For this reason, the case study of how laid-off high-tech workers formulated their own local skills strategy to acquire the necessary competencies to move from unemployment to sustainable employment should be of considerable interest for the growing numbers of knowledge workers everywhere.
1. Introduction

New Economy and Silicon Valley North

This study examines the emergence of a local skills strategy in the Information and Communication Technology (ICT) industries in Ottawa, Canada’s Capital and ‘Silicon Valley North’. In general, the ICT sector is defined as the combination of manufacturing and service industries that electronically capture, transmit and display data and information. These industries, according to media, policy and academic pundits, are synonymous with the ‘new’ economy in which competitive advantage is based upon high knowledge occupations.4

While it can be argued that the importance of knowledge occupations is widespread and not limited to the narrow confines of the high-tech sectors, this study makes the case that the particular story of high-tech employment and unemployment experiences hold some important lessons for knowledge workers in general. As such, the context for and response of the local skills strategy to a crisis in the Ottawa high-tech labour market may be signs of things to come elsewhere. Therefore, this study seeks to clarify what is new and different in contemporary labour market adjustment and, in the process, may be able to offer some constructive comments and suggestions for improvement.

The dot.com boom and bust is now a familiar story, vivid in the memory of affected high-tech firms and workers, and of the collapse of stock prices on the high-tech laden NASDAQ exchange. The essential features of this story can be traced through the dramatic increases in high-tech stock prices, output and employment in 1990s, to its sharp decline in the recession of 2001-2003 and its slow but unstable recovery subsequently.

In early 1997, the ICT sector contributed $33.8 billion to the Canadian economy and by December 2000 this amount had increased by 84% to a peak of $62.3 billion, or roughly 7% of all economic activity in the country and 4.2% of total employment.5 The majority of
employment and hours was found in computer systems design and related services and telecommunications.

This growth was manifested in the form of high-tech clusters, essentially ‘geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities’. During the 1990s, the ICT boom was therefore primarily a big city phenomenon – those over 1 million in population. About two-thirds of all high-tech workers are located in Canada’s largest cities – Toronto, Montreal, Vancouver and Ottawa-Gatineau – where ICT firms created four out of every ten new jobs gained during this decade. The ICT sector was diverse, each cluster had different characteristics that reflected history. Following the R&D established by the federal government in the National Research Council and by Bell-Northern Research owned by Bell Canada and Nortel Networks (then known as Northern Telecom), the Ottawa Technology Cluster was dominated by telecommunications equipment, micro-electronics and software. In the late 1990s, Ottawa’s telecommunications sector grew faster than any of its competitors in North America and had 90% share of Canada’s R&D in industrial telecommunications.6

At the peak of the boom in the first quarter of 2001, the computer and telecommunications (CT) industries employed 650,000 nation-wide. A year later, the number had dropped to 586,000 (-10%) and the unemployment rate had risen from only 3.9% to 6.6%, mostly concentrated in the manufacturing component. The local dimension of this was painfully evident. In early 2005, five years after the peak of the bubble, an Ottawa Citizen article used Statistics Canada data to confirm that the tech sector had lost 27,000 net jobs since the downturn began in the Ottawa-Gatineau metropolitan census area. Ottawa’s most prominent
firm, Nortel, alone shed 15,000 jobs during the period. This perspective lent new credibility to activist claims that there were 10,000 to 15,000 unemployed or underemployed technology workers in Ottawa at that time.7

In a post-mortem four years after the high-tech bubble burst, Beckstead and Brown (2005) investigated whether the dramatic decline was merely a short-term restructuring or whether there has been a structural shift suggestive of longer-run changes, with ICT firms entering a more mature, slower growth stage8 To answer this question, they examine the number of firms entering and exiting the ICT sector against the theoretical framework of the Product Life Cycle. Analyzing data that tracked ICT employment on an establishment by establishment basis obtained from Statistics Canada’s Business Register, entry and exist rates for ICT manufacturing and services are calculated and indexed to their respective sector aggregates. The lesson taken from the results is that the ICT sector continues to attract a relatively large number of new entrants, even though it has undergone a considerable slowdown. They conclude that since the ICT sector continues to attract a relatively large number of new entrants, the slowdown is temporary and not a structural shift.9 The relatively high entry rates suggest firms continue to see new market opportunities. However, there is little evidence that new start-up businesses have relocated towards lower cost, smaller urban and rural areas. It is more likely that the move towards lower cost locations is reflected in the growth of outsourcing overseas.

The Global Context

In the 1990s, observed the Harvard economist Richard Freeman, a new global labour market emerged with the integration of China, India and the ex-Soviet Union bloc within a single economic world based on capitalism and markets. As shown in his chart below, this change effectively doubled the size of the global labour pool from approximately 1.46 billion workers to 2.93 billion workers while, at the same time, shifting the global balance of power to capital by reducing greatly the capital to labour ratio.10
The flow of capital to China and India to employ their low-wage workers puts downward pressure on the employment and earnings of low-skilled workers in developed countries but it poses a major problem for the highly educated as well. The spread of higher education, especially in science and engineering where knowledge is universal, and modern technology to low wage countries effectively reduces the comparative advantage of advanced economies in high tech products and could adversely affect workers in these countries. Multinational firms have responded to the increased supply of highly educated workers by ‘global sourcing’ for workers and locating facilities, including high tech R&D and production, where the supply of candidates is sufficient to get the work done at the lowest cost. Freeman has described this process of moving up the technological ladder by educating large numbers of students in science and engineering “human resource leapfrogging” since it uses low wage highly educated workers, to leapfrog comparative advantage from low tech to high tech sectors. This is further accelerated by the development of computers and the Internet which enhance the potential for

Figure 2: Workers in the Global Labor Force and the Global Capital/Labor Ratio, 2000, Before and After China, India, and ex-Soviet bloc join global economy

Source: Richard Freeman (2006). Employment from ILO data, laborsta.ilo.org/ Millions of Economically Active Persons, 2000 Capital-labor ratio, calculated from Penn World Tables as described in Freeman 2005, scaled so before is 1.00
global firms to move work to low cost operations, putting huge competitive pressures on US, Canadian and British high tech workers. The most powerful statement to this effect was given in 2005 by the Institute of Directors in the United Kingdom:

...the availability of high-speed, low-cost communications, coupled with the rise in high-level skills in developing countries meant off shoring has become an attractive option outside the manufacturing industry. Britain has seen call centres and IT support move away from Britain, but now creative services such as design and advertising work are being outsource. There is more to come. In theory, anything that does not demand physical contact with a customer can be outsources to anywhere on the globe. For many UK businesses this presents new opportunities, for others it represents a serious threat. But welcome it or fear it, it is happening anyway, and we had better get used to it.11

Sceptics may argue that a doubling of the workforce also represents a doubling of markets and that skilled high-tech workers would not be worse off since the skills provided by the new entrants are not perfect substitutes for the existing skills in developed economies and outsourcing is still limited.12 The potential gains from increased trade may offset the potential negative effects of doubling. Yet the real and dramatic churning of the high-tech labour market, in Ottawa and elsewhere, in the past seven years serves to underscore the changing demand and supply of skills that defies complacency. Researchers have noted the increasingly contingent or flexible nature of the employment in the high-tech economic sectors.13

The challenge to advanced countries is to develop business, labour and government policies to make a good transition to a truly global labour market. For Freeman, a good transition scenario for the high-tech industries would have Canada and other advanced countries retain comparative advantage in enough leading sectors or niches of sectors to remain hubs in the global development of technology. This requires that Canada continue to invest in targeted R&D, in domestic science and technology education and keep attracting the best and brightest scientists, engineers and others from the rest of the world. In the present circumstances, the stability and prospects for high-tech growth depend upon finding the right market niches while sector employment is likely to remain volatile with high labour turnover. At the same time, new and flexible labour adjustment policies and programs are required to address the different
re-employment needs of displaced educated workers in contested sectors. Social services and safety net infrastructure need to focus on transition for knowledge workers experiencing job loss, including being a substitute for stagnant, slow-growing wages. As is often the case, local economic and social actions provide the crucible for developing creative responses to new challenges.

**Purpose, Scope and Structure of Study**

This study is part of the OECD Local Economic and Employment Development (LEED) comparative analysis of local skills strategies involving fourteen case studies from eleven countries. To support this international comparison, a common core approach is followed to (a) assess the local context for the development of skills strategies, (b) analyze the design and content of the local skills strategies in relation to skills recruitment and retention, skills upgrading and integration of hard-to-reach groups as may be appropriate, and (c) examine the effectiveness of implementation.

The purpose then is to examine the context and emergence of the local skills strategy in Ottawa’s high technology sector and its operating arm, the Ottawa Talent Initiative, in response to the dot.com and high-tech bust of 2001. This strategy is rooted in a grass roots movement of unemployed high-tech workers from some fifteen self-help groups operating by 2002. It found critical leadership representing community, industry and government stakeholders to develop a community action plan and the subsequent incorporation of the Ottawa Talent Initiative (OTI) as the action centre by late 2004. An exploratory assessment of OTI operations and performance is made through document review, key informant interviews, an OTI client survey and selected interviews, as well as preliminary descriptive and statistical analyses of client and service profiles and results. The study concludes with some reflections on going forward in the development of a sectoral and community-based employment sustainability plan.

The structure of the report is in five sections and reflects the purpose above. Following this Introduction, the report starts with the problem definition of unprecedented job loss for highly
educated, skilled workers in Silicon Valley North and the search for appropriate re-employment services. Against this context, the local skills strategy response is then examined in its development and implementation. Results and impacts are then evaluated against accountabilities increasingly demanded by government funding. A longer-term integrated human resources strategy is then outlined, as proposed by the OTI that is independent of government contingency funding.

However, before proceeding to the next section, it is useful here to lay out the elements of the particular case study approach used in preparing this study.

**Case Study Approach**

The project was formally launched in March 2007 with a site visit to the Ottawa Talent Initiative to meet the Executive Director and interview staff, to develop an orientation to the services provided by the OTI, and to request and examine available documentation. The study team is led by the principal investigator who is a visiting professor at Queen’s University, Kingston, Ontario, and assisted throughout by three Master of Public Administration students and a fourth Economics graduate engaged later during the analysis phase to assist in developing some exploratory multivariate analysis.\(^{15}\)

Given the short OECD timeframe (March – May) that was reduced further by university end-of-term major assignments and final examinations, and a small nominal budget that would be recovered from the OECD, the case study had to be done quickly in a cost-effective way that would produce credible and valid results. This in turn depended upon the access to stakeholders and clients. In the case of the former, access to key individuals who had contributed to the development of the OTI was readily obtained. In the latter, however, OTI kept little systematic information on their clientele, on services used and concrete results. This presented a huge challenge which was only partially met.

Against these time, budget and information constraints, the chosen case study approach is an adaptation of Brinkerhoff’s Success Case Method (SCM) for evaluating impact.\(^{16}\) Originally
developed to evaluate the impact of training in the workplace, the “SCM is a carefully balanced blend of the ancient art of story-telling with more modern methods and principles of rigorous evaluative inquiry and research” that is also practical. It is used to answer four basic questions:

- What is really happening?
- What results, if any, is the program helping to produce?
- What is the value of the results?
- How can the initiative be improved?

This method achieves evaluation efficiencies by adopting a purposive rather than a random sampling approach focusing the bulk of the inquiry on only a relative few participants who have been either exceptionally successful or unsuccessful in utilizing the program in question. It is an economical way to account for the factors which shape the impact of the program intervention. The general process, as adapted for this study, is described below for assessing the OTI:

1. Understand the objectives and intended program impact
2. Survey representative sample of participants
3. Identify participants with highly successful or unsuccessful experiences using services
4. Conduct in-depth interviews with selected participants
5. Identify and quantify, where possible, the nature and degree of impact
6. Provide useful descriptions of impact, relate these to program objectives
7. Provide useful descriptions of program factors which help or hinder successful outcomes
When the core OECD requirements are added, our case study approach involved the following steps:

1. On-site visit of Ottawa Talent Initiative (OTI) facilities, staff interviews, services orientation and documentation review
2. Creating the OTI program logic and impact models that defines what success should look like and validation with OTI staff
3. Background research and literature review on the local context
   - Chronology of key events at sectoral and community levels
   - Labour market data trends on high-tech employment, unemployment, skills/education levels, demography
4. In-person interviews with seventeen principal stakeholders and leaders on organizing the grass roots movement to develop a community-based skills strategy and to establish OTI
5. Designing and implementing a web-based survey of OTI clients
6. Using survey results to:
   - Identify three successful and three unsuccessful respondents for in-depth, personal interviews of what worked and what did not
   - Undertake descriptive analyses of the OTI clientele, the services they used and self-reported concrete results, if any
   - Undertake exploratory multivariate analyses to establish statistically significant relationships, if any, between client demographic characteristics, service usage and results achieved
7. Prepare and submit report to the OECD
2. Unemployment Problem and the Local Context

The dot.com meltdown

The details of the Ottawa high-tech bust can be shown in statistics from various sources but most reliably and consistently from the Labour Force Survey of Statistics Canada. However, before presenting the statistics, we should allow the human voice to speak to the events, none more eloquently than in the interviews of survivors of the high tech crash compiled by two other survivors:18

The beginning of the new millennium turned out to be a difficult and challenging time for many people working in high technology sector. This high-flying industry, the envy of many, fell rapidly and has not yet fully recovered. Tens of thousands of highly-skilled workers lost their jobs and have had a very difficult time finding new work that suits them. What happens when the industry leaves you, as opposed to your leaving the industry? For most people it was a different experience, with a very different job market, one that most high tech workers had not experienced in their lifetime. Some people found work only to be laid off again. Large numbers of very skilled workers are still unemployed or underemployed over five years later. How can they succeed after so much failure? What lessons are there here for tech workers who get hit by the next inevitable convulsion?

Alison Armstrong, one of our interviewees, put it perfectly, “You really don’t think an industry is going to fail that badly”. That is exactly what happened during high tech bust. An industry that was booming changed drastically overnight. The bust began mid-year in 2000. It was at that time that results started to slip. Revenue growth was slowing down. By early 2001 revenue targets were regularly being missed. People were still thinking boom and prosperity as the market was quickly diminishing. Somehow people, particularly the people at the helm, did not see it coming. And then when it was happening, they did not believe it. They saw it as a short term blimp in results.... By early 2001, companies began to react to market conditions....

Companies began to lay people off in ways that they had never done before. Most companies experience on-going layoffs – a cleaning up if you will. But in early 2001 the layoffs were more than the regular “clean up”. Lines of business were being cut from larger businesses. People in those lines of business – no matter how valuable their skill set – were being laid off.... Being laid off had nothing to do with how good or bad a worker you were. It had everything to do with what you were doing at the time.

The broad landscape in the local context, past and present, is illustrated in Doyletech Corporation’s mapping of the Family Tree of Ottawa-Gatineau High Technology companies, summarized below in terms of employment and number of firms for the period 1960-2005.19
Several observations are notable: spectacular growth in the 1990s, and big decline in employment in 2000-2005 along with increasing number of firms, suggesting more SMEs.

**Figure 3**

![High Technology Employment & Number of Firms 1960 - 2005 Ottawa-Gatineau](chart.png)

Source: Doyletech Corporation (2003), A Family Tree of Home Grown Ottawa-Gatineau High Technology

In an October 2001 trade journal article “When Boom Goes Bust”, an industry observer described the consequences of over-spending on acquisitions by major companies to plug gaps in their technology portfolios, when the good times stopped rolling with the onset of recession:
Companies have used many cost-cutting measures to bring spending levels back to earth, including employee reductions that have claimed thousands of jobs. While workers across all industries are looking over their shoulders, the telecommunications sector has been particularly brutalized. According to outplacement agency Challenger Gray & Christmas, through the first nine months of 2001, the telecom industry has laid off 225,231 employees. The computer industry is a distant second with 131,658...

Among large fibre optic players alone, the year’s damage report is grim: JDS has reduced its headcount 55% from its peak of 29,000 to 13,000. The once-unwavering Cisco has eliminated 8500 positions. Corning has cut 12,000 or 28% of its 43,000 employees. And by the end of 2001, Lucent will have cut between 35,000 and 40,000. Worse still, earlier this month Nortel announced an additional 20,000 job cuts, elevating its not-so-grand total to 50,000.20

These were among the large companies that dominated the ICT sector in Ottawa at this time so the scale of local layoffs in the community can expected to be a large fraction of the industry pattern. To identify more clearly the local impact of job shedding in the Ottawa Technology Cluster, we examine the Labour Force Survey statistics in the next section.

**Facts and Figures**

**Employment and Unemployment**

The tables and figures below present the employment and unemployment patterns for the Communications and Technology (CT) sector in the Ottawa-Gatineau census metropolitan area. Annual averages are given for 2000-2006 by CT sub-sectors of manufacturing and services, age, gender and class of worker – whether employee or self-employed. Figure 4 shows the trend in employment in the CT sector from 2000-2006.

In 2000, at the height of the tech boom, CT employment in Ottawa accounted for 67,400 jobs or 12% of Ottawa employment or 10.6% of total CT employment in Canada. CT Services provided 64% of employment with the remaining 36% in CT Manufacturing. On a year-over-year basis, 2001 witnessed significant job losses of 10.2%, followed by continuous declines of 8.8% in 2002, 6% in 2003, and 13.3% in 2004. While there was 17.8% job growth in 2005 and
16% in 2006, the 2006 employment has not yet recovered to the pre-recession level in actual numbers. This aggregate picture, however, masks important within-sector differences. Figure 5 shows that manufacturing was most affected and remains the most volatile sub-sector. As a former supervisor of manufacturing at JDS Uniphase observed at the time, “I was having difficulty finding the kind of position I was used to, because that kind of job doesn’t seem to exist anymore. Manufacturing in this city has largely dried up.

A lot of companies are doing ‘fab-less’ manufacturing...doing the actual manufacturing in other countries.”

CT manufacturing operations were shed as the supply chain became global. The sharp and prolonged employment drop for women and low-skilled workers was driven by...
waves of layoffs initially in assemblers of high-tech manufactured goods, followed by declining clerical staff and then jobs normally requiring a college education.

Table 1: Employment in CT Industries, 2000-2006 Annual Averages, Ottawa-Gatineau

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<th>2000</th>
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<th>2006</th>
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<tr>
<td><strong>Total CT Sector</strong></td>
<td>67.4</td>
<td>60.5</td>
<td>55.2</td>
<td>51.9</td>
<td>45.0</td>
<td>53.0</td>
<td>61.5</td>
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<td>Manufacturing</td>
<td>24.1</td>
<td>19.6</td>
<td>13.7</td>
<td>12.4</td>
<td>12.6</td>
<td>15.2</td>
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<td>Services</td>
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<td>Ottawa economy</td>
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<td>577.9</td>
<td>576.0</td>
<td>606.6</td>
<td>609.1</td>
<td>618.5</td>
<td>643.3</td>
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<td><strong>CT share (%)</strong></td>
<td>12.0</td>
<td>10.5</td>
<td>9.6</td>
<td>8.6</td>
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<td>8.6</td>
<td>9.6</td>
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<td>National economy</td>
<td>634.8</td>
<td>664.0</td>
<td>622.6</td>
<td>599.5</td>
<td>587.5</td>
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<td><strong>CT share (%)</strong></td>
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**Age**

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<td>15 to 24</td>
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<td>6.6</td>
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<td>25 to 54</td>
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<td>51.9</td>
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**Ottawa employment**

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<td>15 to 24</td>
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<td>94.6</td>
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<td>Men</td>
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<td>45.2</td>
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**Ottawa employment**

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<td>Men</td>
<td>296.5</td>
<td>311.1</td>
<td>302.2</td>
<td>316.2</td>
<td>313.1</td>
<td>316.4</td>
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<tr>
<td>Women</td>
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<td>266.8</td>
<td>273.7</td>
<td>290.3</td>
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<td>302.1</td>
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**Class of worker**

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<tr>
<th>Class</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>59.8</td>
<td>55.1</td>
<td>45.7</td>
<td>43.6</td>
<td>39.0</td>
<td>45.7</td>
<td>54.3</td>
</tr>
<tr>
<td>Self-employed</td>
<td>7.6</td>
<td>5.4</td>
<td>9.5</td>
<td>8.3</td>
<td>6.0</td>
<td>7.3</td>
<td>7.3</td>
</tr>
</tbody>
</table>

**Ottawa employment**

<table>
<thead>
<tr>
<th>Class</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>487.6</td>
<td>504.2</td>
<td>497.2</td>
<td>527.0</td>
<td>532.1</td>
<td>545.0</td>
<td>563.0</td>
</tr>
<tr>
<td>Self-employed</td>
<td>75.3</td>
<td>73.7</td>
<td>78.7</td>
<td>79.6</td>
<td>77.0</td>
<td>73.5</td>
<td>80.3</td>
</tr>
</tbody>
</table>

**Source:** Statistics Canada, Labour Force Survey

Other notable characteristics of CT employment are that it is predominately and increasingly male (70% in 2000 and 72% in 2006), the largest age group falls in the 25-54 category (88% in 2000 and 90% in 2006), and roughly four of every five are employees although there is a high
degree of self-employment activity (11% in 2000 rising to a peak of 17% in 2002 before leveling off to 12% in 2006). Relative to the Ottawa working population, men represent more than two-thirds of the CT workforce compared to slightly more than half of the Ottawa workforce. The CT sector is more concentrated in the median 25-54 age group, with significantly fewer young workers (15-24) and older workers (55+) than the metropolitan city. Interestingly, the employee/self-employed numbers are roughly similar across the years, although there is a marked increase in CT self-employment in the four years following the 2001 bust.

Qualifications and skills, including education, are directly linked to CT occupations which are in turn related to earnings. Using skill definitions by Human Resources Development Canada, Bowlby (2003) constructed the occupational picture of the CT sector in its first three years of bust as follows:

Table 2: Employment by Occupation in CT Industries, 2001-2003

<table>
<thead>
<tr>
<th></th>
<th>First Quarter</th>
<th>Change</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2002</td>
<td>2003</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>649.8</td>
<td>585.7</td>
<td>570.0</td>
<td>-9.9</td>
</tr>
<tr>
<td>Managerial and professional</td>
<td>338.1</td>
<td>302.5</td>
<td>306.8</td>
<td>-10.5</td>
</tr>
<tr>
<td>Managers</td>
<td>76.7</td>
<td>68.8</td>
<td>59.7</td>
<td>-10.2</td>
</tr>
<tr>
<td>Engineers</td>
<td>45.5</td>
<td>31.3</td>
<td>34.8</td>
<td>-31.3</td>
</tr>
<tr>
<td>Computer programmers &amp; systems</td>
<td>193.9</td>
<td>179.6</td>
<td>191.1</td>
<td>-7.4</td>
</tr>
<tr>
<td>analysts</td>
<td>22.0</td>
<td>22.9</td>
<td>21.1</td>
<td>3.9</td>
</tr>
<tr>
<td>Technical</td>
<td>180.4</td>
<td>163.8</td>
<td>162.7</td>
<td>-9.2</td>
</tr>
<tr>
<td>Line &amp; equipment workers</td>
<td>29.2</td>
<td>25.3</td>
<td>22.1</td>
<td>-13.3</td>
</tr>
<tr>
<td>Sales specialists</td>
<td>42.4</td>
<td>39.9</td>
<td>34.5</td>
<td>-6.0</td>
</tr>
<tr>
<td>Engineering technicians</td>
<td>62.1</td>
<td>63.8</td>
<td>70.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Other</td>
<td>46.7</td>
<td>34.8</td>
<td>35.6</td>
<td>-25.5</td>
</tr>
<tr>
<td>Intermediary and elementary</td>
<td>131.3</td>
<td>19.4</td>
<td>100.6</td>
<td>-9.1</td>
</tr>
<tr>
<td>Assemblers in manufacturing</td>
<td>41.7</td>
<td>30.3</td>
<td>28.4</td>
<td>-27.2</td>
</tr>
<tr>
<td>Clerical</td>
<td>76.5</td>
<td>73.4</td>
<td>59.3</td>
<td>-4.0</td>
</tr>
<tr>
<td>Other</td>
<td>13.2</td>
<td>15.0</td>
<td>12.8</td>
<td>18.3</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, Labour Force Survey, using HRDC skill definitions
From the change column of Table 2, we can see that 9-10% cuts are made between the first quarters of 2001 and 2002 across the three main occupational groups. However, this masked much deeper declines within these groups. Engineers took a sharp drop of 31% from the Managerial and Professional group, while the Line and Equipment Workers and Other Workers were cut 13% and 26% respectively within the Technical occupations. However, all the lowest Skill Intermediary and Elementary occupations (those not normally requiring college or university education) bore the brunt of layoffs over the two years, with manufacturing assemblers plummeting 27% in the first wave, followed by 19% reduction in clerical, and 18% in the residual Other category, in the second wave.

The CT workforce is well educated, with more than three-quarters having attained a post-secondary degree in all occupations except Technicians and Other IT workers. Engineers are particularly highly educated, with almost 90 percent having a post-secondary degree. Table 3 provides detail on the educational attainment. Particularly noteworthy is the attainment of post-education degrees in three occupations – Engineers (26%), Managers (17%), and Analysts (15%).

**Table 3: Educational Attainment of IT Occupations 2000-2005**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>16</td>
<td>28</td>
<td>11</td>
<td>34</td>
<td>12</td>
</tr>
<tr>
<td>Managers</td>
<td>12</td>
<td>21</td>
<td>10</td>
<td>40</td>
<td>17</td>
</tr>
<tr>
<td>Engineers</td>
<td>6</td>
<td>11</td>
<td>6</td>
<td>51</td>
<td>26</td>
</tr>
<tr>
<td>Analysts</td>
<td>12</td>
<td>24</td>
<td>10</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>Programmers</td>
<td>12</td>
<td>26</td>
<td>10</td>
<td>39</td>
<td>13</td>
</tr>
<tr>
<td>Technicians</td>
<td>24</td>
<td>38</td>
<td>14</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Other IT</td>
<td>16</td>
<td>36</td>
<td>13</td>
<td>23</td>
<td>5</td>
</tr>
</tbody>
</table>

1. Secondary school completion or less, plus trade certificate/diploma
2. Community college, CEGEP
3. Some post-secondary, university diploma below Bachelors
4. Bachelor’s degree
5. MA or PhD

Source: William G. Wolfson (2005), educational attainment from LFS
Such qualifications also conferred a wage premium to CT employment. Average earnings show that workers in CT industries earn more than workers in the rest of the economy. Weekly wages for IT occupations in the period 2000-2005 fell in the modal salary range of $801-$1000, with Managers and Engineers at the top end, Programmers and Analysts in the middle range, Technicians and Other IT workers at the low end. Figure 6 shows that a wide and growing gap between earnings in CT industries relative to all other industries. It also shows that earnings for women lag behind men’s but they earn higher average salaries in CT industries, partly because their level of education are higher than their counterparts in the rest of the economy.

Figure 6. Average Weekly Earnings by Sex of CT and non-CT Industries, 1997-2002

Source: C. Vaillancourt (2003): 14

Table 3 below shows that the unemployment story over this period is really about the years 2001-2003, when the jobless figures were in the 3,000 – 4,000 range each year. These subsequently subsided in 2004-2005 and reached the same low unemployment level in 2006 as observed in 2000. Cumulatively, for 2001-2005 at least 14,600 individuals were unemployed in this sector (which should not be taken as a measure of net job loss). As Statistics Canada does not report levels less than 1,500 in any given year, the total unemployed numbers are likely to be higher in reality. Within the CT sector, manufacturing unemployment was higher than services when considered against its lower employment base. In 2001 manufacturing
unemployment rose to 9.2% and to 15.3% in 2002, as compared to 3.7% and 5.6% in CT services in the corresponding years. Not surprisingly, given the bulk of employment is in the 25-54 age group and among men, these also were the primary unemployed groups.

### Table 3: Unemployment in Ottawa-Gatineau Census Metropolitan Area, 2000-2006 Annual Averages

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>('000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0.0</td>
<td>3.3</td>
<td>4.4</td>
<td>3.1</td>
<td>1.8</td>
<td>2.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.0</td>
<td>1.8</td>
<td>2.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Services</td>
<td>0.0</td>
<td>1.5</td>
<td>2.3</td>
<td>2.0</td>
<td>1.5</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 to 24</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>25 to 54</td>
<td>0.0</td>
<td>2.6</td>
<td>3.6</td>
<td>2.8</td>
<td>1.5</td>
<td>1.6</td>
<td>0.0</td>
</tr>
<tr>
<td>55 +</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>0.0</td>
<td>2.0</td>
<td>3.2</td>
<td>1.8</td>
<td>0.0</td>
<td>1.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Women</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Source:** Statistics Canada, Labour Force Survey

**Note:** 0.0=less than 1,500 for Ottawa-Gatineau

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**Immigrants in Ottawa’s High-Tech Cluster**

Immigrant flows to Canada have always been concentrated in the largest cities so it is not surprising that there is a coincident clustering of high-tech economic activity and immigrant settlement in a small group of cities. Immigrants may contribute strategically to a high-tech cluster in a number of ways. They may fill critical skills shortages, provide access and linkages to external markets, or engage in entrepreneurial activity. Recent research on this topic draws upon two confidential Statistics Canada data files – the Longitudinal Survey of Immigrants to Canada, and the 1991-2001 Census microdata (the 20% sample). Overall, the findings are that immigrants are over-represented in the high-tech sector, with over one-quarter of those employed in that sector in 2001 were immigrants while accounting for only one-fifth of all employed in Canada. Further, immigrants play an increasingly larger role in high technology.
The level increased from 24% in 1991 to 28% in 2001, an immigrant high-tech employment growth rate of 85% over the 1990s, as compared to a 9.4% employment growth overall, 15% growth in immigrant employment, and 61% high-tech employment growth.

### Table 4: Immigrant High-Tech Employment Growth, Selected Cities, 1991-2001 (percent)

<table>
<thead>
<tr>
<th>City</th>
<th>Growth in all employment</th>
<th>Growth in all immigrant employment</th>
<th>Growth in high-tech employment</th>
<th>Growth in immigrant high-tech employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>9.4</td>
<td>15.3</td>
<td>61.1</td>
<td>85.8</td>
</tr>
<tr>
<td>Ottawa-Hull</td>
<td>10.7</td>
<td>25.3</td>
<td>85.0</td>
<td>138.9</td>
</tr>
<tr>
<td>Toronto</td>
<td>15.0</td>
<td>23.9</td>
<td>61.7</td>
<td>87.6</td>
</tr>
<tr>
<td>Montreal</td>
<td>5.7</td>
<td>9.7</td>
<td>65.5</td>
<td>88.3</td>
</tr>
<tr>
<td>Vancouver</td>
<td>19.1</td>
<td>37.7</td>
<td>72.4</td>
<td>109.6</td>
</tr>
</tbody>
</table>

Source: Peter V. Hall (2006), author’s analysis of Statistics Canada, custom tabulation

Table 4 shows that, over the 1990s, Ottawa-Hull (now Ottawa-Gatineau) is notable for having the highest growth rates in both high-tech employment and immigrant high-tech employment, as compared to Toronto, Montreal and Vancouver. Table 5 shows the earnings differences between immigrants and the native-born in high-tech employment in the same cities.

### Table 5: Difference in Annual Earnings of High-Tech immigrants vs Native-born, Selected Cities, 1990 to 2000

<table>
<thead>
<tr>
<th>City</th>
<th>Difference in 1990</th>
<th>Difference in 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>$3,462*</td>
<td>-$230</td>
</tr>
<tr>
<td>Ottawa-Hull</td>
<td>$4,337*</td>
<td>-$1,828*</td>
</tr>
<tr>
<td>Toronto</td>
<td>$3,116*</td>
<td>-$10,938*</td>
</tr>
<tr>
<td>Montreal</td>
<td>$3,391*</td>
<td>-$2,040*</td>
</tr>
<tr>
<td>Vancouver</td>
<td>$1,794*</td>
<td>-$5,788*</td>
</tr>
</tbody>
</table>

*Difference significant at the 95% level

Source: Peter V. Hall (2006), author’s analysis of Statistics Canada, custom tabulation
During 1990, average annual earnings of immigrants were significantly above those of the native-born in high-tech employment, with Ottawa-Gatineau seeing the largest gain for immigrants. By 2000, this had reversed, with earnings of high-tech immigrants significantly below those of the native-born – Ottawa-Gatineau having the smallest difference but Toronto showing a huge gap. To explain the observed differences and changes in immigrant earnings relative to native-born high-tech workers, a standard wage equation was used to control for demographic and human capital characteristics of individuals. The key findings for 1990, across Canada and holding other things equal, are that all immigrants earned significantly less than non-immigrants, and this trend has intensifies over the last decade. However, the earnings gap is smaller and declining in the high-tech sector over the 1990s. Again, the overall trends mask important differences in the labour market performance of high-tech immigrants in different cities. The regression analysis confirmed that the high-tech sector earnings premium for immigrants increased in 5 major cities studied (Calgary, Montreal, Ottawa, Toronto, Vancouver), but most dramatically in Ottawa where high-tech sector workers earned almost 22% and immigrant high-tech workers earned 6% more in 2000. Finally, there is evidence that high-tech sector employers are able to recognize foreign education and foreign experience more readily than other employers, consistent with the notion that high-tech immigrants are valued connectors to external networks, resources, knowledge and contacts.

**Bust Revisited**

To sum up, the bust was not a brief anomaly, but instead persisted for several years. By September of 2001 the unemployment rate in Canada’s CT sector had roughly doubled from 2 to 4 percent. This level of high-tech unemployment persisted for approximately two years in Canada, reaching a high of 5.8 percent in the summer of 2002. In Ottawa, the bust saw thousands of people laid off in months, a ten percent office vacancy rate, a tighter municipal budget, and a 2004 run on food bank services where 20% of users held a post-secondary degree. The local media extensively chronicled the region’s economic downturn and its effect and was for years embroiled in a ongoing very public debate with business leaders and politicians about the nature of the high-tech meltdown and its recovery. Multiple sources of
statistical information on jobs and job loss contributed to the ambiguity in public discourse, with growing gaps between the household labour force survey estimates by Statistics Canada and the more positive estimates from technology sector subscriber establishment surveys conducted by the Ottawa Centre for Research and Innovation (OCRI). This was the confusing local context in which unemployed high-tech activists and community leaders emerged, initially as informal grassroots networks and, in the absence of suitable public policies and programs, they came together later as a collective voice in shaping their own action plan to respond to persistent unemployment and underemployment.
3. Local Skills Strategy Response

The local skills strategy response to the boom-to-bust events was shaped by both informal grassroots organization as well as by more formal institutional infrastructures which were either in place or emerging by the beginning of the 21st century in Ottawa. This story is told by beginning with the human dimensions of the unemployment problem, sketching the contours of the community-based networks that emerged and finishing with the partnerships that developed and implemented a community action plan. As a response to the pressing needs of unemployment and underemployment, the action plan went beyond a narrow skills development focus. However, emphasis will be given to factors influencing the skills strategy.

The `spectrum of pain’ when boom goes bust

The `tech wreck’ hit in the spring and summer of 2001. The lead players in Ottawa’s telecom and photonics clusters – notably Nortel Networks and JDS Uniphase – announced a series of major layoffs that were unprecedented in scale and speed. Anthony Muller, chief financial officer for JDS, summed up the staggering losses at the time: “We knew there would be two headlines...We lost $51 billion [goodwill charge against acquisitions], and we laid off [7000] workers”28 Between March 2001 and October 2002, it was estimated that the National Capital Region’s technology sector lost 15,000 jobs.29 Between 2001 and 2005, it was clear that this was not a short-term anomaly, particularly for the two `anchor’ companies closely identified with massive layoffs – it is estimated that Nortel reduced its Ottawa workforce from 17,000 to 5,000 and JDS from 10,000 to 500 over this period.30

When a few of the high flyers went down, many other companies were affected, causing them to drop. If the company that was your major customer was no longer buying, or was cutting back severely, you were in trouble. It was a domino effect throughout the whole industry, with one company after another cutting back or closing down altogether.31
The initial slack in labour demand, according to Jackson and Khan (2003), was picked up by the federal government, the largest employer in the region. This was a reversal of 1995 when the private sector picked up the slack created by federal government downsizing that followed program review, affecting 45,000 employees nation-wide, 15,000 of which were in Ottawa-Gatineau. Until then, Ottawa was known as a government town and technology was not a high profile employer and relatively hidden community. That changed when the growth of the high-tech sector in the 1990s allowed the industry to recruit extensively from universities (Nortel alone hired 25% of all engineering graduates in Canada), from abroad, and absorbed many dislocated public service workers in the process, becoming the second ranked employer in the process. When the tables turned in 2001-2002, the federal government hired 13,000 new employees – many of whom were high-tech refugees. A key finding of a national survey of information technology (IT) occupations was that approximately one-third of public sector IT workers had their previous job in the private sector. Government contracts during this time also kept many tech firms viable. These operated increasingly with contingent workers on contract, consultancy or part-time arrangements. If there was some positive flowing from the layoffs, it was an enormous growth of spin-off companies. An estimated 400 technology start-ups were created, many of them by engineers and entrepreneurs using severance packages from their former employers.

While the evidence suggests that government hiring and spending were able to moderate the considerable economic and social damage resulting from the high-tech layoffs, the full impact of the technology meltdown had not yet been played out. More layoffs, from a widening array of companies in the high-tech supply chain, were made over the next few years. The start-ups have yet to prove themselves and the knowledge worker households affected will have expended much of their savings and equity, following exhaustion of their buy-out packages and of Employment Insurance (EI) benefits in the years ahead. As Employment Insurance entitlement is based upon maximum insurable earnings and the region’s unemployment rate, EI was not a lot of money for high wage tech workers and Ottawa’s maximum was 38 weeks.
Those who got laid off early in the downturn usually found work fairly quickly, often only to be laid off again and again, as it turned into a buyers’ market where highly qualified applicants became painfully aware that “I’m a dime a dozen. How do I make myself unique?” As one jobseeker puts it,

*A large part of it was the economy and then the other part of it was that I did not have a specific skill set that could be easily and readily applied to the area in which I wanted to work....They were looking for someone who had done successfully in their previous job exactly what they were looking for in this job....When the economy is booming and there is a shortage of people, then they will take a chance on some having the right skills to move into the position and when the economy hunkers down, then it is a case of you having to absolutely fit exactly what they want, because they can’t take a risk.*

For most, getting back to work took much longer than expected. As late as 2003, an observer can say “There’s a whole spectrum of pain out there. I know many people who have been out of work for two years.”

Even for the 28 success stories that had “landed” and who were interviewed by Caputo and Wallace (2006), their collective experience was that:

*No one, however, was prepared for how long it would take to find paying work again. They all expected that their unemployment would last a few months at most. For most, it took one to three years, and that long period of uncertainty and financial instability created the greatest tests.*

For many, this included intermittent spells of contract work and underemployment doing part-time paid work or working outside their industry such as stocking shelves in retail outlets.

**Grassroots Sprouting**

Initially, the large major firms provided generous layoff, buyout or retirement packages, along with on-demand transition, customized career and outplacement services with a designated human resources company such as Right Management. As layoffs became more frequent over time, even these severance packages were cut back considerably. Those in smaller firms got little or no severance, often with only two weeks notice, and went to public employment services to establish Employment Insurance claims, to seek employment counselling and to conduct job searches. These resources, it would appear, were neither sufficient nor
appropriate for many high-knowledge workers. As one respondent wrote in the OTI survey conducted as part of this study,

*One needs to recognize just how devastating the crash was to many people in the Ottawa area. At the beginning of 2000, the newspaper boy was being offered a well paid high-tech job. At the end of 2000, highly educated professionals in the high-tech community (say having worked for Nortel for 20 years or more), were rounded up and indiscriminately fired. There were no jobs for these people, and there were thousands of them in the Ottawa area. So Ottawa had thousands of men and women, many with advanced education having cost the Canadian government thousands of dollars, sitting at home besides themselves as to what to do. Any government support or placement support provided by the company that laid them off amounted to ‘we’ll work on your résumé, and send it out, and you should look for job opportunities’. Which was all rather silly, since there were no jobs. The government should have stepped in with retraining etc. Instead, people were left to wither.*

Another summed up the sentiment held by many high-tech unemployed people: “When you work with the current existing programs available through HRDC [Human Resources Development Canada, now Service Canada], you rapidly discover that they’re really not designed, really not thought of for people with advanced education and the degrees and the experience”. ³⁷

Searching for alternatives, many joined informal workplace or community-based networks that offered a meeting place for technology-related jobseekers. Peer support was something that was not offered in the private or public outplacement services. The challenge, for many, was connecting with the right people who has information “about a field of work, about a company that interests you, about jobs that might be open now or soon, about who the hiring manager is, about the corporate culture in the organization”. ³⁸ One network, the Kanata Kareer Group, also provided some unique on-the-ground intelligence on the situation of its unemployed member through periodic surveys. While not scientific probabilistic samples, we nevertheless get a snapshot of the unemployed high-tech workers in many dimensions not captured through the official Labour Force Surveys. The December 2003 survey of its 440 members found that for the 236 respondents:
• 38% had been unemployed for more than one year
• 29% were on Employment Insurance, 32% had exhausted their claim, 20% had not yet started [either because of 2 week EI waiting period or until severance was exhausted], and 20% did not qualify; 14% reported desperate financial circumstances
• There was a high percentage of older workers – 43% were 45+, 56% were prime age 25-45, and only 1% in the youth category of 15-24
• The majority of layoffs was once in the past five years – 67% one layoff, 26% 2 layoffs and 7% experienced 3 or more layoffs
• Telecom was the single sector concentration representing 78% of previous employment
• Top four job targets were software (26%), hardware (22%), management (19%), and consulting/specialized services (21%)
• It was a highly educated group with 64% having attained a post-secondary degree, and 13% with industry certification
• Less than half had been called to a job interview – 46% no interviews, 33% averaging 1 interview/month, 12% with 2 interviews/month, and 9% with three or more/month
• It was revealing that 20% of respondents wanted to stay employed in the CT sector, 38% had decided to change, and 41% wanted help in knowing where to go.

By 2004, at least twenty self-help, peer network groups were organized in Ottawa’s high-tech sector, many with overlapping membership. Their specific purposes ranged from networking related to exploring new career options outside the high-tech sector, to creating new business opportunities, skills development, marketing skills, job finding clubs, and technology sector renewal. Most operated on a face-to-face basis while some were web-based organizations with Yahoo discussion groups. As the ebb and flow of these networks showed over time, volunteer organizations are always at risk of losing their key people when they are successful in re-employment, sometimes as a result of the group networking. We should be wary of the aphorism that volunteering only leads to more volunteering. At some stage, volunteer-management is essential for sustained, focused effort and that may be a necessary operational cost.
Strategic Coalitions

Community Partners and Peer Networks

The move to coordinate group activities came, in the first instance, from the Western Ottawa Community Resource Centre (WOCRC) – a Kanata community support organization established in 1986 to provide accessible health and social services, and funded by all three levels of government. In June 2003, staff began noticing a new trend, unusual numbers of middle-age men dropping off or picking up children from programs, usually seen as a sign of families in distress. WOCRC began asking questions at the local career peer support meetings and heard that large numbers of workers in the high-tech industry had been out of work for a long time and many were families in emotional and financial distress, having lost savings and their pension investments when the value of their stock options sunk like a stone.

To consult with citizens more widely, the WOCRC hosted an open town-hall meeting. At the meeting, volunteers responded to the call for action and began sorting through the town-hall suggestions in order to set priorities. The town-hall volunteers identified something called “employer engagement” as being uppermost on everyone’s mind. What were employers thinking? Who’s hiring and what skills are they looking for? How can a tech worker get a foot in the door? Another priority was about “coaching and mentoring” the unemployed on how to network, update skills and job search. To follow-up, a second town-hall was convened in late July which updated the audience on their new priorities, and formed committees to take the project through its next phase.

In October 2003, two awareness-raising events were organized by a small business networking group CAbIN (Career, Arts, Business, Initiative and Networking) Global. This group attracted strong leadership that politically active, wanted collective action and was not hesitant in public advocacy through the media, and lobbying governments and the business community.

Sufficient momentum had developed from the town-hall and CAbIN Global public events by November 2003 that a meeting of the broader groups was called with the City of Ottawa to explore a joint approach. Within hours of the media coverage of this event, OCRI’s executive
director of government-funded TalentWorks, Cheryl Gorman, was contacted by the Prime Minister’s Office (PMO) and was asked what was needed to “fix it”. There was a collective sense that something needed to be done, that the City needed to find out something about the size of the problem, and that the needs of the high-tech unemployed cannot be met through existing public and community services. The outcome was a commitment to develop a common vision.

**Ontario Ministry of Training, Universities and Colleges**

While the unemployed were organizing themselves informally in grassroots volunteer networks, the Ontario Government approached Nortel and JDS in the immediate aftermath of their layoffs with offers of assistance from its Labour Adjustment Service [now part of the Ministry of Training, Universities and Colleges (MTCU)]. This offer was rejected on the basis that these multinational firms ‘can take care of their own’. In 2002, worried about the scale of layoffs from a widening group of companies, a similar approach was made by Paul DeLatt of the Ontario Labour Adjustment Service to Ottawa Centre for Research and Innovation (OCRI). Nothing happened for a year, partly because OCRI, which represented the technology industry, thought there was no need for government intervention as the unemployed were ‘all professional people with companies lining up to hire’ and there were private outplacement services. There was also the view that the Ontario Adjustment Services were not knowledgeable about knowledge workers and their needs.

**Governments, The Ottawa Partnership (TOP), and TalentWorks**

While the Ontario government reacted to the tech crash through its Adjustment Service, all three levels of governments were also proactive in community workforce development. This was especially notable in Ottawa where the municipal government engaged broad formal community consultations on ‘smart growth’. Collaboration was taking place on skills development as an economic development issue. At the height of the technology boom in 1999-2000, the regional municipality of Ottawa-Carleton initiated The Ottawa Partnership (TOP), recognizing the need for a board of private and public leaders as the economic
development steward for Ottawa committed to advancing the local economy. Its members represented a cross-section of the city’s major employers, economic development agencies, chambers of commerce, government and education. To improve and grow Ottawa’s economy, TOP focussed its initial attention to the region’s “economic generators” of wealth – specifically, the clusters of industries, their primary suppliers and supporting institutions that drive economic development. Seven ‘mature’ industry clusters are recognized as central to Ottawa’s economy. Four of these are part of the high-tech sector, including telecommunication equipment, microelectronic, software and communications, and photonics. A fifth, professional services, cut across all clusters. The remaining two include life sciences and tourism. To accelerate cluster development while balancing economic growth with social equity and environmental sensitivity, TOP advocated public policies designed to ensure that clusters have access to the essential inputs for cluster competitiveness. Among the most important inputs are Human Resources – where cluster firms have “access to a skilled and adaptable workforce which, in turn, will require that workforce development programs in the future should be designed around the specific needs of Ottawa’s clusters”. Workshop development was the top priority for the Telecommunications Equipment, Software and Communications, and Photonics clusters.

To meet the workforce challenge, cluster initiatives for the high-tech clusters are proposed. For Telecommunications Equipment, a comprehensive skills training initiative is identified in which survey firms will identify key skills required across cluster firms and compile database of skill needs linked to information on relevant education and training programs in the region. The sources of leadership for this are seen to be the cluster working groups, local universities, colleges, private institutions, and larger telecom companies. The governance proposed is OCRI as champion, working with cluster co-chairs and top leaders of educational institutions. Funding is seen to come from HRDC, Ontario Ministry of Education, Ministry of Energy, Science and Technology, and the Federal Smart Communities. A second major initiative, championed by the co-chairs of key clusters, is proposed to develop and implement a Human Resources Attraction Co-operative which combines recruitment resources of individual cluster firms. This
envisions a comprehensive database within Ottawa region websites with links to relevant high-tech companies, industry associations and academic institutions.

For the Software and Communications cluster, several priority actions are identified, including supplementing university professors’ salaries with private sector consulting agreement to attract and retain university professors in software engineering and photonics, creating a mechanism that enhances collaborative relationships between the educational/training institutions and the cluster. A pilot project with a large firm is suggested, along with an internet-based survey of software firms to gauge skills needs to support continuous changes to specialised training modules. The potential champions for this are OCRI and the Software Human Resource Council, with funding from HRDC, City of Ottawa, education/training institutions with private sector matching funds.

For Photonics (fibre optics imaging), the particular challenge is that of a ‘skills mismatch’ in the workforce – well educated people without the specific skills needed by industry. The proposed initiative is the design and delivery of a “re-skilling” program for the region’s underemployed, immigrant University graduates, building around the VITESSE Bridging Program (VBP). As an independent not-for-profit organization, Vitesse Re-Skilling Canada Inc. was created through a partnership between the National Research Council, University of Ottawa, Carleton University and knowledge-sector employers to address a critical human resource shortage and subsequent barrier to growth in the ICT sectors identified in the Ottawa-Carleton Regional Innovation Forum Roundtable (April 1996). The program trains internationally trained professionals (ITPs) in Canadian workplace practices and technical communications through work placements or internships, offering certification upon successful completion.

In its economic vision for Ottawa, TOP strongly advocated coordinated workforce development as the means to address the challenges of developing, recruiting and retaining skilled workers, especially in the high tech industries. In the long term this coordination should ensure that talent pool gaps are identified, programs are set up to address these gaps and that an accountability and feedback mechanism is clearly established between the demand and supply
sides of “New Skills for Ottawa”. In the short term, three projects are recommended as part of the “Skilling Ottawa” flagship of the Economic Generators Initiative:

- An education and training information “portal” or database, organised by occupation and general skill sets and referencing all public and private sector sources of job skill training;
- A customised Vitesse re-skilling program, initially for Photonics but later transferable to other clusters; and
- A CEO-education compact to better plan cluster skills demand and supply

Following release of the TOP report, the seven clusters agreed to explore one HR umbrella group to implement the “Skilling Ottawa” project. In 2001, the City of Ottawa was created through amalgamation and OCRI was funded by the City and later by the federal and provincial governments with building TalentWorks as the HR umbrella group to provide strategic support for the community talent pool. Guided by a steering committee of representatives of public and private sector employers, job-seekers and community groups, TalentWorks is managed by an OCRI Secretariat and is also accountable to The Ottawa Partnership.

To prepare its action plan to respond to the Ottawa Partnership Economic Generators report and Partners for Jobs (a City of Ottawa initiative focused on the unemployed and underemployed), TalentWorks published three reports in 2002, starting with Ottawa’s Workforce Environment, followed by Profiling Ottawa’s Workforce, and concluding with Ottawa’s Workforce Development Strategy. The November 2002 workforce profiling report was the first supply and demand study undertaken at the time when the tech sector was starting to be in trouble and was instrumental in setting the course in the 2003 Talent Plan adopted by the City of Ottawa as the foundation for its Skilling Ottawa project. The impact of the recession, especially coinciding with the dot.com crash, changed the diagnosis of demand for skills in the high tech sector. Where the TOP report advocated concentrated skills support in 2000, during the height of the dot.com boom, for five of seven industry clusters which were tech-related (microelectronics, telecom, photonics, life sciences, software), by 2002 the
TalentWorks profiling report did not specifically identify a tech sector as requiring unequivocal recruitment and retention support. Instead, the 2003 Talent Plan made the following sobering commentary on the ICT sector talent pool demand and supply:

The recent downturn in ICT has created a temporary over-supply I many job categories, particularly software-related positions, mid-level managers, intermediate and junior engineers, business development positions, and positions that have significant budgets attached to them, such as marketing and advertising managers. However, there is still a critical shortage of microchip designers (a worldwide shortage), optical systems designers senior business leaders, and people with certain specific skills, such as web designers, RF engineers, ASIC designers, top salespeople and some programmers (ERP, PeopleSoft, Oracle and Java). These shortages are not as widespread as they were in 1999-2000, but are nonetheless capable of severely inhibiting the growth of local companies.

Although the core technical skills required by workers in this sector remain somewhat stable, specific technical skills change radically. It is unclear which skills local companies will need to develop or attract in the next five years.48

As well, building on some of the workforce recommendations of the earlier TOP report, the Talent Plan created the framework for working with the sector and individual job-seekers through five strategic directions:

- Enhance community capacity to address workforce opportunities and challenges
- Support sector-specific projects
- Provide centralized, ongoing access to workforce information
- Create a career guidance network
- Support skill development and recruitment initiatives.

However, this action plan was effectively scuttled in May 2003 – one month after the publication of the Talent Plan, by the federal government withdrawal from continued investment in the workforce infrastructure and only funding projects instead.

In the Fall of 2003, TalentWorks was asked by the City of Ottawa to bring peer networks of technology workers and community partners together to address employment needs.
Ottawa Talent Initiative

By January 2004, the steering committee formed by peer networks and community partners to seek collective action on addressing high-tech unemployment had come around to the view that this was a community and sectoral adjustment problem, and not a single company adjustment issue. As such, any response required government assistance and a meeting was convened with the three levels of government. The Ontario Government, in providing a $12,000 - $15,000 grant, advised the working group to hire an outside consultant to develop an action plan within three months. The name Ottawa Talent Initiative (OTI) was adopted for the working group but OCRI was the formal recipient of the grant as it was the only legal entity that existed at the time. In OCRI’s view, OTI absolutely was a part of achieving the City of Ottawa’s Talent plan. OTI own view of itself was that of “a grass roots organization composed of unemployed technology workers and community volunteers working together to create positive change for the unemployed and underemployed technology workers in the Ottawa area”

To recapitulate, the chronology of key events in strategic coalition formation included:

2003-June 9  1st town hall organized by the Western Ottawa Community Resource Centre (WOCRC)
2003-July 29  A second town hall organized by the WOCRC and the Kanata Kareer Group to prioritize project areas; a team is set up to develop these ideas into full-fledged project descriptions (called Positive WORK and included OCRI resource person)
2003-Oct 1    1st Cabin Global event gives birth to a “Hope” initiative to help the unemployed
2003-Oct 9    Cabin Global’s Lets Get Working group established to organize a 2nd public event
2003-Nov 26   Exploratory meeting held between Let’s Get Working, The Ottawa Network, Kanata Kareer Group, Positive WORK, the City of Ottawa and OCRI; agreed to try and create a joint approach
2003-Dec 2    First meeting of the collective November 26th group with broad peer network group support; agree to try and work on one community initiative going forward
2004-Jan 8    Meeting with all three levels of government staff to determine interest in supporting a community initiative; strong support
2004-Jan 15   The Ottawa Talent Initiative team name, structure and mandate adopted
2004-Jan 26   Project funding secured from the Ontario Ministry of Training, Colleges and Universities (OMTCU) to develop a Community Action Plan
Community Action Plan

OTI’s first task was “to create a framework so that Ottawa job-seekers, economic development agencies, agencies serving job-seekers, and all levels of government can coordinate action to address a significant talent management problem – the persistent unemployment and underemployment of technology workers”. Decisions on strategic direction for an action plan were made shortly after securing the planning funds. OTI proposed a ‘targeted, tactical project aimed at obtaining quick wins and visibility while demonstrating local solutions to local problems’. Specifically, three strategies were outlined – growing jobs in Ottawa, providing immediate support for unemployed and underemployed technology workers, and providing assistance to technology workers in transitioning their skills to other sectors. To meet these strategies, the OTI organized a public Ottawa Talent Forum in February 2004 at the Nepean Sportsplex facilities provided by the City of Ottawa, and engaged and consulted with some 500 people to solicit possible projects. By April 2004, the Community Action Plan (CAP) was completed, largely through the pen of Dave Sproule of the KKG. Eighteen projects were put forward. In their strategic groupings, they included:

Job Creation:

1. A Grow Jobs in Ottawa Forum – 1-2 day workshop involving key stakeholders in the community wanting to develop concrete solutions to growing jobs in Ottawa
2. Information Exchange with Various Industry Sectors
3. Develop High Tech Specific view of Economic Forecast Data
4. Co-op/Internship Program
5. High Technology Infrastructure program.

Immediate services and support:

6. Creation of a High Tech Community Action Centre
7. Extended Employment Insurance benefits
8. Career Counselling and Family Support services
9. Financial Counselling
10. One-on-one intervention for long term unemployed
11. Targeted Skills Training with Financial Assistance
12. Transition Training – Labour Market and Economic Data

Transitioning to other sectors:
13. Identify skills and gaps of Technology workers intent on moving to other career areas
14. A Transition assessment program
15. French language training
16. Career Counselling for Transitioning Technology Workers
17. Sector Transition Subsidy
18. Sponsorship for security clearance

For accountabilities, expected outcomes were also identified for the three strategies. Potential partners and implementation were detailed for each of the eighteen projects but CAP considered the top two priorities in the short-term to be the Job Growth Forum and the establishment of a high-tech community action centre.
4. Implementation

**OTI Community Action Centre**

To create an operational plan, including resource requirements, a project governance structure was established under the strategic direction of a Steering Committee composed of members of the community, primarily representatives of the unemployed peer networks, OCRI and the City of Ottawa. The steering committee was supported by a communications team, a project team and an events team. Its priority next step was to put into place a community action centre within three months.

Both the Ontario Government and the City of Ottawa supported the creation of an action centre with a combined grant total of $279,000 for the first year of operation (88% Ontario, 12% City) beginning in June 2004. OCRI continued to support the OTI by acting as its legal entity in the receipt of public funding and participating as a member of the Steering Committee. At this time, OTI was joined by two experienced organizers Gary Davis (the current executive director) and Joe Stelliga, initially as volunteers but later as paid program directors to set up the action centre. Staff was recruited essentially as volunteers. This was consistent with the Ontario Adjustment Service, a program based on volunteer service. A significant in-kind contribution was space, furnishings, computer and related equipment, abandoned by a bankruptcy, offered by the corporation managing the Kanata Research Park for low nominal rent. The OTI Action Centre opened its doors to clients in September 2004.

During this first year, the OTI operated mainly through client volunteer activities based upon an innovative business model of task forces or business engagement programs. This was in keeping with the desire to have the action centre resemble a dynamic business environment, consistent with the business background of its staff/clientele, and made the OTI a client-driven service organization. It was also the *modus operandi* put forward in the Community Action Plan. Numerous topical task forces, ranging from market analysis, business engagement, consulting, entrepreneurship, academic institutions to communications, were set up in which
OTI clients worked in project teams to make contact with businesses, government and institutions to develop mutually beneficial relationships with the high-tech community. The initial results were poor and unfocused, depending upon the level of volunteer commitment and leadership. This improved with changes introduced to pay five task force leaders two days of wages for five days working weeks and they were made accountable for project management. Nevertheless, the Achilles heel to such volunteering initiatives was the inability to maintain leadership continuity and the “revolving door volunteers” situation was difficult to manage. To meet other service obligations developed in the Community Action Plan, several regular, on-going activities were held at the Action Centre. This included: Monday morning Coffee Connections for informal peer networking; weekly group discussions on the ‘Human Side of Looking for a Job’; weekly OTI orientation sessions and introductions to staff, task force leaders, and visiting Northern Lights (YMCA/YWCA) employment counsellors funded by Human Resources Development Canada; and weekly technical and job search workshops featuring speaker presentations from various institutions.

In June 2005, in anticipation of funding renewal and fearing liabilities, the OTI became incorporated as a non-profit organization, resulting in a formal Board of Directors under the chair of Marianne Wilkinson (now an elected City of Ottawa Councillor) to provide strategic guidance, while the Board appointed Executive Director, Gary Davis, was made responsible for day-to-day operations. The second funding application to the Ontario Ministry of Training, Universities and Colleges (MTCU), however, was initially rejected for two reasons. First, financial assistance from Adjustment Service to plant closures typically ran six months only and there was no precedence for longer-term sectoral adjustment, despite the MTCU mandate for community and sectoral adjustment. OTI was therefore something of an experiment to the MTCU but the initial results were not encouraging to continue the funding arrangement. This was the second reason for turning down the application as the MTCU did not receive any evidence documenting concrete achievements as the OTI did not monitor its activities in any systematic way. In this case, the funding instrument of a grant also had little accountability requirements.
In the months leading up to the June 2005 anniversary date, the OTI Chair and Executive Director met with high level politicians and senior federal bureaucrats to solicit ongoing support.\textsuperscript{60} The political lobbying and the negotiations with Human Resources Development Canada (HRDC) succeeded in securing a one-year contribution agreement of $497,000 which imposed higher levels of accountabilities for expenditures. Performance metrics and a system to track and report were subsequently established, informed in part by those created by Cheryl Gorman for evaluating the success of Talentworks but at a much more basic level.\textsuperscript{61} When the 'feds' came in, the Ontario Government decided to stay in, as it considered the OTI to be 'our baby'. A further $180,000 was granted by the Ontario MTCU and the City of Ottawa also partnered for another $36,000, thereby extending their financial commitments to 31 December 2006.

With a combined funding of $713,000, the OTI quickly expanded its operation in its second year to offer mainstream employment services tailored to the high-tech unemployed while maintaining employment engagement activities through two primary task force vehicles – the Business Engagement Task Force and the Consulting Market Place Task Force. Over this period, in accordance to the performance metrics reported, the OTI served some 6,100 clients, posted some 1,200 job opportunities, contacted over 700 companies, and had over 600 task force participants. No information, except anecdotal, was available on jobs resulting from using OTI services – whether in the form of interviews, offers or acceptance. While this information met the HRSDC contribution agreement accountability requirements, it was not sufficient to convince the federal government to continue funding the OTI upon conclusion of its agreement. The Ontario MTCU concurred as the performance metrics, which are essentially measures of activities and outputs, still did not tell the Adjustment Service what was actually achieved in results or outcomes. Yet it should be noted that the OTI submitted items in the HRDC budget proposal to evaluate the program and track outcomes of client success in finding jobs. This was rejected by HRSDC at the time, which resulted in the budget being dedicated to delivering core programs to assist with employment rather than resource the monitoring required to follow up with each client to track their job-finding success. The requirement from HRSDC was specific –
to meet the target numbers of clients participating in programs but not the numbers of jobs found.

Service Canada (formerly the operating arm of HRSDC) by now had the view that the high-tech industry had largely recovered from its recession and did not require special measures. At the same time, the federal government was to devolve Labour Market Partnership programs to the province on January 1st, as part of the federal-provincial Labour Market Development Agreement. In an announcement of impending closure made by Wilkinson and Davis in November 2006, an appeal was made for business and individual support to keep the OTI open until they had the chance to approach the provincial government again in the new year.62

Following intense political lobbying through Marianne Wilkinson’s extensive networks along with client action and media coverage through television, radio and newspaper interviews, the Ontario Government announced on 12 January 2007 a third one-year grant of $350,000 to keep the OTI open. A reduction in half of its previous year’s budget has meant a reduction in level of services and it is anticipated that the OTI will close in November 2007, allowing several months to dispose of its assets and close out the project. The OTI services will then be transitioned to a new Ontario Employment Assistance Provider. In the meantime, the OTI is developing a community-based, sectoral solution to the management of human resources with sustainable livelihoods as the prime objective. Before outlining this next phase of development in the concluding part of the report, the next section examines the activities and results of the OTI as it operates today.

**Evaluation Assessment of OTI Operations and Results**

It is noteworthy that the key informant interviews consistently pointed out two key and related challenges for the OTI – sustained funding and performance measurement. From a public funding and accountability perspective, good metrics include basic indicators describing who the clients are, what services they use, and what are the results observed. Impact, however, is assessed in a comparative way, usually examining the program outcomes for participants and eligible non-participants. In short, impact evaluation involves testing what economists call a
'counter-factual', namely what would have happened in the absence of a program such as the OTI. Both results and impacts rely on how success is conceived in the OTI.

To develop an understanding of what constituted success and about the availability of institutional data, an onsite visit to the OTI offices was arranged at the beginning of the project. Two primary conclusions were reached. The first was development, with OTI staff, of a logic model and impact model for its operation. The second was that baseline data is either fragmented or missing, perhaps in part to the rejection by clientele of the required monitoring, to the selection of only a few indicators in the absence of an integrated monitoring plan, to the limited capacity of a relatively young organization, and perhaps due to limited assistance by funding agencies in specifying appropriate accountability measures. To the selection of only a few indicators in the absence of an integrated monitoring plan, to the limited capacity of a relatively young organization, and perhaps due to limited assistance by funding agencies in specifying appropriate accountability measures. The logic model provided clarity on the relationship between activities, results and outcomes. The absence of administrative data presented a major challenge to investigate empirically those relationships.

**OTI Program Logic**

Inadequacies of performance information systems in general have, over the past twenty years, led to the development and refinement of the program theory matrix or simply the logic model as a means of systematically addressing numerous concerns. Today, this is a foundation for performance monitoring and evaluation recognized worldwide. In Canada, all grants and contribution programs funded by the federal government require such a logic model which makes explicit the linkages and attribution between inputs, activities, results and outcomes. Following the seminal work by the Australian evaluator, Sue Funnell, an impact narrative was developed immediately following the OTI onsite visit, services orientation tour and staff interviews. The essential feature here is to identify the factors within the control of OTI that affect program outcomes.

The more traditional logic model, in the accepted practice advocated by the Treasury Board of Canada, is presented below in Figure 7. Another alternative view is presented in Figure 8, following Robert Brinkerhoff, which is used to guide the development of the OTI client survey. The essential difference between the two is that Figure 8 is much more focused on laying out
the functional capabilities offered by the OTI through critical applications, linked to results and goals.65

These matrices provide practical guides on what success may look like and how success may be related to actual services provided and received. On success or what clients/staff consider to be important outcomes, there would appear to be four candidate measures – peer emotional support and network, improved confidence from relevant job search tools and techniques, soft and business skills training, and high-tech employment promotion engagement with businesses and educational institutions. Each of these contribute to the adjustment process and may, singly or in combination, lead to re-employment or self-employment which is the ultimate measure of success.

When we examined the OTI administrative data against either the logic or impact models, it became clear that regular, systematic measurements of activities, outputs and outcomes are not available. Data are kept on certain services utilized, mainly around the registration of participants in specific OTI events and in task force groups. There is little beyond this by way of systematic recording and reporting. On the client profile side, OTI maintains a simple register for daily signing-in of clients which is useful for head counts. However, there is nothing collected that will describe the clientele in their demographics or services receipt. Clients registered on-line to access services and events which generated a client contact list with roughly 1,450 names with email addresses. To become a registered member the client was required to submit the curriculum vitae electronically to an OTI databank which was used in a worker-job electronic matching service in 2006. All participants in events have been tracked electronically after July 2006 to date, and a JCP Project began in May 2007 to track people employed or retraining.

So within a few weeks of our onsite visit, we had developed a reasonable idea of what to evaluate and not how to evaluate the OTI given the data lacuna. At this point, it is critical to fit the evaluation to the problem at hand where real-world constraints of missing data, short timeframe and limited budget led to an evaluation strategy of combining the Brinkerhoff
Success Case methodology with a short client survey used to provide client, services and results information. The survey data would allow some exploratory analyses to be attempted which may better ground future evaluation efforts. The survey would also allow a select number of successful and less successful cases to be identified for personal interviews, thereby providing some solid qualitative information of why certain things worked and others did not.
## Figure 7: Ottawa Talent Initiative – Logic Model

<table>
<thead>
<tr>
<th>Component</th>
<th>Activity</th>
<th>Output</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote OTI</td>
<td>Advertise OTI services via: Radio, Print, Television</td>
<td>• Amount of media coverage, # newsletters published</td>
<td>Awareness of OTI, • Increase client confidence, • Increased employability, • Broader network</td>
</tr>
<tr>
<td>Provide office</td>
<td>Enable client use: Telephone, Fax machine, Office space, Computers, Photocopiers, printers</td>
<td>• # of clients using facilities</td>
<td>• Re-employment in relevant field</td>
</tr>
<tr>
<td>infrastructure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engage clients</td>
<td>• OTI tour, Orientation, Coffee connections, After hours connections, Human side of looking for job, Resource advisor session, Client call-back</td>
<td>• # of visits, # orientations, • # clients to Engage Clients events, # client-Res. Advisor sessions</td>
<td>• Sustained livelihood in the Ottawa knowledge-based economy</td>
</tr>
<tr>
<td>Develop clients</td>
<td>• Soft &amp; business skills, Sell yourself training, Tactical job search, Résumé assistance, Interview strategies</td>
<td>• # clients to Develop Clients events, # clients completed certification, # clients gained new skills</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>• Business engagement task force, Consulting marketplace task force, Entrepreneur task force, Labour market information reports, trends</td>
<td>• # employers contacted, # clients doing pro bono work, # job postings, # OTI employment events</td>
<td></td>
</tr>
<tr>
<td>engagement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liaise with</td>
<td>• Determine industry contacts’ needs, Determine curriculum of educational programs</td>
<td>• # industry contacts, # schools contacted</td>
<td></td>
</tr>
<tr>
<td>industry, schools</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 8: OTI Impact Model

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Critical Applications</th>
<th>Results</th>
<th>Goals (Organisation)</th>
<th>Goals (Clients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide office services to the high-tech unemployed.</td>
<td>Advertise OTI.</td>
<td>Clients visit action centre</td>
<td>Provide office services that enable the high-tech unemployed in their job search.</td>
<td>Emotional support.</td>
</tr>
<tr>
<td>Create a personal and emotional support network.</td>
<td>Provide telephone, fax, computers, printers, internet, meeting space.</td>
<td>Office services used.</td>
<td>Networking opportunities</td>
<td></td>
</tr>
<tr>
<td>Create new networking opportunities.</td>
<td>Offer tours and orientations.</td>
<td>Clients gain knowledge of OTI.</td>
<td>Use of office facilities</td>
<td></td>
</tr>
<tr>
<td>Provide information and training to improve technical skills and job-search skills.</td>
<td>Coffee connections.</td>
<td>Clients meet and network with one another.</td>
<td>Skills training</td>
<td></td>
</tr>
<tr>
<td>Use existing contacts to re-engage clients with employers.</td>
<td>Career counselling.</td>
<td>Clients given personal career counselling.</td>
<td>Employment contacts</td>
<td></td>
</tr>
<tr>
<td>Use business knowledge to assist in entrepreneurial projects.</td>
<td>Host speaking events and seminars that offer: business and soft skills development, job search strategies, resume assistance, technical information, external communication course and interview strategies.</td>
<td>A wide variety of well attended speaking events.</td>
<td>Job postings</td>
<td></td>
</tr>
<tr>
<td>Determine demands of industry, to match with needs of clients, and capacity of educational institutions.</td>
<td>Connect clients with employers through job postings.</td>
<td>Clients made aware of jobs.</td>
<td>Re-employment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facilitate contact with business through programs (Business and Consulting engagement.)</td>
<td>Clients introduced to potential employers.</td>
<td>Increase employability through the improvement of skills.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Help organize and encourage entrepreneurial groups.</td>
<td>Clients start their own businesses.</td>
<td>Re-employment in relevant field.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Liaise with industry and educational institutes.</td>
<td>Meetings with industry and educational institutes.</td>
<td>Sustained livelihood in the Ottawa knowledge-based economy.</td>
<td></td>
</tr>
</tbody>
</table>
OTI Client Survey

The survey was designed to collect data on three things – reason for going to the OTI, services received and results, and the demographics of the respondents. Using the impact model and narrative, we developed a survey questionnaire that was reviewed with OTI staff for accuracy. Pre-tests were conducted in two waves, each following an iteration of the questionnaire. When we were satisfied, the web-based online survey was finalized and the OTI sent out email invitations to all 1,450 individuals from their client contact list, with the web link embedded in the message. Confidentiality was ensured as the respondent would be signing in directly with a web survey company hosting our OTI survey and access was restricted to only members of the evaluation team. The survey was posted for nine days and resulted in 131 responses or roughly 9% of the contact list. Follow-up was not possible given that the receipt of the web-based emails could not be confirmed.

It should be clearly understood that this was not a scientific survey with a probabilistic sample for two reasons. First, we did not have a proper client data base with information on key client population characteristics by which a random sample can be selected and compared. Second, we only had access to a simple contact client list which may or may not be representative of the target client group. Consequently, the OTI survey is designed for convenience sampling of self-selected responders and therefore may be a biased sample. As the name implies, the sample is selected because they are convenient and the trade-off made for easy availability of survey participants is the representativeness of the sample for which we have no information. This non-random method is often used during preliminary research efforts to get a gross estimate of the results, without incurring the cost or time required to select a random sample. However, in the absence of a random process for selecting respondents from an unknown target group, there is no scientific basis for inferential statistical analysis. As long as we do not claim that the results are representative of the group as a whole, we can safely use this sampling technique to tap into what a convenience sample of respondents had to say. It is a good source of insights and data in exploratory research.
Following the completion of the survey, it was during the survey analysis phase that we began to suspect some integrity issues with the data. The critical section on OTI service offerings consisted of skip pattern questions, in which respondents were asked whether they used a particular service. If they did not, the online survey skipped to the next question. If they did use the service, however, they would then be referred to ancillary questions about frequency of use and choice of possible concrete results. However, the data analytical file indicated that there may be problems in believing some of the answers. As a result, all 131 individual surveys were printed and painstakingly reviewed for proper skip patterns. Unfortunately, this review revealed that approximately 90 of the 131 surveys encountered some information which was misaligned to the skip pattern for service questions after the first few were properly answered. However, the first section on reasons for going to the OTI and the third section on demographics were relatively complete. Clearly there was a technical glitch that pre-tests did not encountered and from which there was no return. This may be a very high price to pay for conducting relatively inexpensive online surveys in which the infrastructure diagnostics and support are limited. Despite this information loss, some useful multivariate analysis was accomplished using partial service data which will be reported in the Appendix. For now, the following figures provide a hint of who are the OTI clientele, at least for the respondent groups.

**Client Profile**

OTI clients are mainly older workers in the 45-64 age group, with almost a third more in the typical mid-career category. It is notable that very few young (15-24) or prime age (25-34) high-tech unemployed use OTI services. While the age profile of the unemployed in the Ottawa CT sector is mainly concentrated in the 25-54 age group, our sample suggests that the OTI is drawing much more from the older end of this spectrum. Indeed, the 2007 sample is older than the December 2003 KKG benchmark.
survey sample, in which 65% were over 40 and 43% were age 45+. The age characteristic raises the policy question whether the OTI services are appropriately tailored to the needs of older workers or whether it should be targeting clients more reflective of the high-tech unemployed. Without a doubt, the services are more complex and re-employment prospects more difficult with respect to older workers. As one respondent puts it, OTI did not really help him in his transition, as most of the organization’s services are geared towards the more typical worker in the high tech industry, instead of senior executives.66

Three-quarters of the OTI sample are men. This is a higher proportion than the two-thirds observed for the Ottawa CT workforce in the Labour Force Survey. Whether unemployment affected men more than women cannot be determined as the CT unemployment numbers are not reported in their entirety given Statistics Canada’s practice of simply noting when population cells contain less than 1,500 individuals.

The education profile again echoes the defining characteristic of the high-tech knowledge worker. About 63% of our OTI sample had attained a baccalaureate or better, and a further 29% had a post-secondary college diploma or certificate. One in five had obtained their educational qualification abroad, confirming the view that the CT sector recognized foreign credentials.

![Figure 11: OTI Clients by Educational Attainment](n=102)

<table>
<thead>
<tr>
<th>Educational Attainment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-doc</td>
<td>2%</td>
</tr>
<tr>
<td>Doctorate degree</td>
<td>3%</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>25%</td>
</tr>
<tr>
<td>P-S cert./diploma</td>
<td>29%</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>36%</td>
</tr>
<tr>
<td>High school grad</td>
<td>4%</td>
</tr>
<tr>
<td>&lt;High school</td>
<td>1%</td>
</tr>
</tbody>
</table>

![Figure 12: OTI Clients by Place of Education](n=102)

<table>
<thead>
<tr>
<th>Source of school credential</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian educated</td>
<td>79%</td>
</tr>
<tr>
<td>Foreign educated</td>
<td>21%</td>
</tr>
</tbody>
</table>
At the same time, 90% were Canadian citizens at the time of the survey, by birth or naturalization. A further 9% were new Canadians with landed immigrant status. Only 1 percent was non-Canadian with work visas as their immigration condition of staying in the country.

When we examine the previous employment history of respondents, the most striking attribute was their previous salary which was at the high end of the technology industrial wage – 34% earned $100,000 and more annually, 18% reported $80,000 - $100,000, and 23% were in the $60,000 - $80,000 range. This reflects in part the years of service in the industry, with 67% of the respondents claiming 10 years or more before being laid off. Firm size before layoff is also reported – roughly 50% worked for an organization with 500 or more employees, 20% worked for companies with between 100-499 staff, and another 20% were engaged in firms with 20-99 employees. Only 5.9% of respondents worked for a small company with fewer than 19 employees. When questioned about their occupation, two-thirds of respondents held management or professional positions prior to layoff. Another third had worked in technical, engineer technician positions. Only one respondent was an assembler in manufacturing. By industry sub-sector, 40% had worked in high-tech Services, half of whom were involved in
software and computer services while one-quarter were in telecommunications, and one-fifth in technology services. Roughly 25% were involved in the Manufacturing sub-sector, a third of whom were in communications equipment manufacturing and another third was in telecommunications.

The OTI survey was able also to gauge the frequency of layoffs for this client sample. The majority (57%) had experienced only one layoff since 2000 but more than one in five (21%) had been laid off three or more times during that period. Again the comparison is compelling between the December 2003 KKG survey and our 2007 OTI survey, bearing in the mind that the KKG survey asked about layoffs in the previous 5 years while the OTI survey covered essentially 7 years. In one aspect, the incidence of only one layoff had dropped 10 percentage points since the December 2003 survey benchmark, when 67% experienced one layoff. However, the fraction of the OTI clients who had suffered three or more layoffs had tripled from 7% in 2003 to 21% in 2007.

Apart from describing the OTI clientele based upon a convenience sample, we can say something about the reasons given by respondents for using OTI services. On the positive side, word-of-mouth and OTI advertising through various media together represented 34% of all reasons given for seeking out the OTI. On the other hand, there was a significant push factor
(46%) arising from inadequate or non-responsive services to the needs of these high-tech jobseekers. Roughly 12% of all responses highlighted the absence of any employer assistance.

**Services Received**

The OTI survey also asked respondents about the type of services received and their frequency of use. The partial survey services results and the logic model showed that services can be combined to generate four groups of like services contributing to overall success. These four groups included:

1. Peer-to-peer support and networking
   a. Tour of OTI facilities
   b. Coffee Connections
   c. After Hour Connections
2. Job search assistance
   a. One-on-One Session with OTI Resource Advisor
   b. Job posting board
   c. ‘Jump start your job search’ session
   d. Résumé assistance
   e. Interview strategies
3. Skills development and training
   a. Soft and business skills events
   b. Course on how to communicate with businesses
   c. Technical courses (e.g. project management certification)
4. Employment promotion engagement
   a. Business engagement task force
   b. Consulting market place task force
Success, Non-Success Cases

The Success Case Method approach used in this study has two major steps. First, in its original design, a brief survey is sent to a large representative sample of all OTI clients asking one key question about the extent to which the respondent believed that the OTI has made a significant different to their transition adjustment. Instead, we seized the opportunity to collect additional information on clients, services and outcomes that were not available elsewhere. To the extent that we were able to understand better the clients, their use and assessment of services, the survey went beyond its original purpose which was to select small core samples of exceptionally successful and unsuccessful clients. The survey still served its purpose of identifying successes and non-successes from the 105 completed responses. These cases were identified and ranked according to whether the respondents felt that the OTI was a success, who felt that it was emotionally supportive, who used the Action Centre facilities, who took the OTI orientation tour and found it useful, and who had a One-on-One session with the OTI resource advisor. The top ten successful and unsuccessful cases were used to contact the persons for in-depth telephone interviews. These provided immediate results on the effects of OTI and other factors that enhanced or impeded their re-employment adjustment. The six ‘impact profiles’ can be found in Annex A and are summarized as follows:

<table>
<thead>
<tr>
<th>Successful Cases</th>
<th>Unsuccessful Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Benefits and Contributions</strong></td>
<td><strong>Major Benefits and Contributions</strong></td>
</tr>
<tr>
<td>• OTI’s major impact through its emotional support and networking potential, the understanding coming from a shared experience of the bust and of the high-tech industry. “OTI filled a hole in the process of getting back to work that no one else understood had to be done or had the background to help me get back to work...staffed by people who have been through the ups and downs of the market, they are the few people who understand what is is like to go through the ups and downs, that is critical, and they have been</td>
<td>• Being able to find “kindred spirits” was the main benefit of OTI. “I got to meet some folks that I wouldn’t have otherwise met.” <strong>Barriers and Suggested Improvements</strong></td>
</tr>
<tr>
<td></td>
<td>• OTI services are aimed at those who are unemployed instead of under-employed. Events and activities are held during business hours which are inaccessible to those operating their own businesses. “OTI needs to distinguish itself by holding more evening programs, organizing events at different evening locations, making it more accessible to those living outside of</td>
</tr>
</tbody>
</table>
part of the high-tech industry so they get it, they understand it”. OTI provides a place for people to reconnect to a network, and more importantly, a network of people who are like them, thereby normalizing their situation.

- “High-tech people need to be able to sell themselves to employers to succeed, and the OTI enabled them to do so.” OTI facilities sped up job search and the involvement with task forces reconnected him with potential employers.
- OTI services are tailored to high-tech job seekers based on a better understanding of the Ottawa high-tech sector landscape. This includes customizing mainstream employment services as well as the unique task forces.
- Adopting a business-like model of operation requires an administration that was run more like a business and able to “articulate the value of the OTI to business leaders”.

**Barriers and suggested improvements**

- While the high-tech sector is turning around, there are still experienced workers who are chronically under-employed. OTI should work harder to determine the needs of the industry and communicate these needs to the unemployed, underemployed and educational institutions.
- Problems in the sector include the inability of small start-ups to train, of skills shortages created by unrealistic employer expectations, and employers’ failure to recognize the value of older highly skilled workers. OTI could offer more training but could also educate the industry about the value of existing skill sets.

Kanata, and tailoring some of its services for the underemployed”.

- “I would get more benefit from OTI if they focused more on people in the entrepreneurial space.”
- Networking events need to be better managed. “I found that the group of people who attended were very socially closed. Some had a very negative outlook...the facilitator did not really create an environment that would make people want to socialize and network. Those people have really specialized needs because they have had a rough time.”
- “Government is the real problem” – the federal government’s policies on bilingualism, security clearance, and certification requirements bar experienced individuals from successfully landing high-tech employment in the public sector.
- While OTI has helped him trade “war stories” with individuals who find themselves in a similar situation, the usefulness of such networking is limited. “The problem is that everyone is your competitor”, explaining that others won’t share valuable information that might lead them to a job. In addition, some individuals monopolize the time at networking activities such as Coffee Connections, taking the group discussion off topic.
- OTI’s biggest challenge is that it is not an organization that engages in advocacy work, especially with the government to overcome “artificial barriers” to jobs.
- “The real issue in the Ottawa area is that there are not enough open positions” for workers in the high-tech industry. More capital investment is required to stimulate new start-ups and high-tech ventures.
• “I would like to see OTI get more involved in the creation of new jobs, but is this within the realm of their remit? I feel strongly that the big issue in the Ottawa area is not that there are not enough skilled workers, but that there are not enough jobs.”

The successful cases, some of whom are still unemployed, are unanimous in their appreciation of OTI value added – (a) providing emotional and networking support from industry peers, including staff who have experienced employment and unemployment in the high-tech sector, and (b) recognizing and leveraging a business orientation to job search that reconnects jobseekers to potential employers in direct and indirect ways. The unsuccessful cases did not appear to realize the same expectations on these benefits, and were sometimes put off by the experience of networking events. For successful cases, OTI could be improved by adopting new lines of business to gathering and providing industry intelligence on skills shortages to help the under-employed. While helping the employers understand something of the 80:20 rule in which an unemployed or under-employed person may have 80% of the skills in demand and some on-the-job or training investment to make up the remaining 20%. For the unsuccessful cases, recommendations are more wide-ranging – the OTI should become involved in advocacy work to relax entry barriers to high-tech government jobs as well as the promotion of job creation in the technology sector, manage better networking events, support entrepreneurial networking and provide accessible services after regular business hours for the under-employed.

Much of this is echoed in the open-ended survey responses to the general questions on how OTI has been a success for those who viewed it positively and what could be done to improve OTI operations. The following sampling provides a flavour of the commentaries:

*How Successful?*

*OTI is made up of technical people help technical people. They have been where OTI members are and have been. They understand and put together a process that addressed what the members needed. They are part of us, not a government worker trying to understand what we are about, not a social worker, not a young person using a young person’s methods to get a job.*
High tech people in general have issues with communication and ‘soft skills’ and OTI helps us with this very specific issue. We don’t get trained on how to find a job, how to network, how to get connections and the numerous workshops offered by OTI allow people to acquire those skills. It also gives people a reason to get out the door in the morning rather than stay home depressed about not finding a job.

Participating at the OTI has renewed my confidence after the initial emotional upheaval of being laid off. In addition, by participating in the Business Engagement Task Force, I have been able to meet with technical hiring managers without the need to try to sell myself, allowing a more relaxed and upbeat approach.

Truly it could have been much more of a success, if greater participation was sustained, as in the beginning with its grass roots origin. People got involved, but unfortunately the Task Forces did not achieve its potential. Currently it has become more like a standard Employment Services organization, rather than focusing on the real issues of getting to the root of the Hi-Tech problems.

OTI actively involves and encourages input from those in the affected, specialized demographics to work together to help develop feasible solutions instead of using a ‘one size fits all approach’ (which seems to be the case in more mainstream ‘support provider’ organizations, i.e. government, Service Canada and other groups such as ‘Northern Lights’). OTI looks for new ways to provide services in a more effective, forward looking and sustainable manner. It started off providing support to unemployed resources in specialized demographics. OTI has since branched out to look for meaningful methods to help those who are employed but caught up in the post industry crash phenomenon of term or contract employment, bridge-survival job underemployment scenarios. The goal is to help these useful resources break the underemployment cycle to get back into meaningful full employment.

It offers some degree of networking plus courses such as the Project Management Institute (PMI) seminars which I completed last fall. Courses such as this would normally cost several thousand dollars, which for unemployed workers, high tech or not, are out of reach.

OTI understands well educated and experienced high tech professionals. Government programs are more geared to the blue collar hourly worker.

It provided a venue to meet other high tech people and acted as a place to find partners for a startup. These people provided the complementary skills required to develop a startup.

The traditional Service Canada counselling services (other than the IT Overview course) do not understand High Tech workers at all. For example, I took TecSults’ three-week Job Finding Club. While cold calling may work in some industries, it is much more
difficult to be effective at it in High Tech. OTI’s Business Engagement Task Force has a much better suited implementation of the idea.

**What to Improve?**

I found OTI useful if you are a software developer or programmer but for those of us who are former supervisors/managers, it was not helpful.

It would be useful to compile all the things that actually worked and publish them. Coffee connections is dominated buy a few outspoken individuals who eat up most of the time complaining. It would be helpful to expose the blatant age discrimination that is going on in Ottawa....Nobody wants to say out loud what we are all thinking: why is this [government] job going to a younger person, or a francophone, when there are so many older, anglos who are ready, willing and able to work?

As a professional organization it was not. As a bunch of volunteers or midly paid people it was sufficient.

**OTI needs to progress and focus on more than just finding a person his next piece of work or placement. I suggest that the relationship between OTI and the individual has to change and the focus needs to be on sustainability. Experience shows that whatever work is obtained, the work will end again. Permanent employment is becoming a rare thing in today’s work world....Many enterprises would prefer to treat employment expenses and wages as a variable cost and write it off as a project expense as opposed to the past when it was treated as a fixed cost at the enterprise level.**

I’d like to see OTI work at bringing together employers/industry, governments and workers to address our issues. Industry is claiming they can’t find workers to fill their positions, yet there is a large pool of available talent that cannot find jobs. Why is that? How can these workers be retrained to fill those positions? How will Canada compete in the knowledge industries against low wage countries that are churning out vast numbers of science and engineering graduates and want to excel in the knowledge industries as well?

On balance, it would seem that the OTI has provided valuable services and benefits for the 90% of its clientele which gave it a success rating. It has been knowledgeable about the needs of the unemployed high-tech workers and has been innovative in shaping services to meet those needs, subject to the vagaries of public funding. From an accountability perspective, what is clear is that documented success through regular, ongoing monitoring would have put the OTI on a much more solid footing with public funding agencies and would have enabled it to differentiate itself from other employment assistance services. Better documentation of the
innovative task force approach of volunteers helping themselves through an institutional vehicle and by established contacts, as well as how mainstream employment services are customized for an industry-specific, knowledge worker clientele, could have served as best practices elsewhere. This section has offered some clear indications of the type of information required, as well as some analytical tools for making sense of what works.

While the OTI has achieved a high satisfaction rating from its clientele, there also has been a growing sense that it needs to become more knowledgeable about the needs of the industry sector to more effectively bridge the demand for and supply of highly skilled workers. The last two survey comments capture this well. There is also the impending closure of the OTI which is greatly concentrating the mind on what the future may hold for the OTI mission. The Board of Director for the OTI and its executive director Gary Davis have been exploring an industry-wide, community-based solution to sustaining high-tech livelihoods. The sharpening focus of OTI activities towards addressing the changing skills demand is evident in the evolution of services to provide unemployed clients with appropriate industry job search skills, in combination with rapidly changing industry core technical skills and the emergence of strategic non-technical skills that are now *sine qua non* of high tech jobs at all levels.

**Addressing the Skills-related CAP Commitments**

The creation of the OTI Action Centre provided an organizational means for addressing the eighteen commitments of the Community Action Plan devised by and for the unemployed tech community. It is worthwhile to consider, for the purposes of the OECD skills study, what has happened to the CAP skills-related commitments. Nine of the eighteen commitments have a skills focus, either job search skills or ICT sector-specific technical/non-technical skills. Apart from the OTI action centre itself to establish the infrastructure and procedural requirements identified in the CAP, other non-skill commitments were to industry and government information exchange on labour market information or to lobby for such public policy changes as extended employment insurance benefits, a sector transition subsidy, sponsorship for
security clearance, job growth, and a high technology infrastructure program. The remaining skills-related CAP commitments included:

- Career counselling and family support services
- Career counselling for transitioning Technology Workers
- One-on-one intervention for long-term unemployment
- Identify skills and gaps of Technology Workers interested in transition to other career areas
- Transition assessment program
- Targeted skills training with financial assistance
- French language training
- Transition training - labour market and economic data
- Co-op / Internship program

While all plans provide guidance to future action, fidelity to implementation depends on changes in the environment, institutional capacity and priorities. From the beginning, the OTI planning committee set as its primary operating principle: “we value short-term results given the immediate needs of our clientele. We are engaged to resolve a current need and are not building an ongoing institution”.67 In large part, it became a fine balancing act between OTI short-term priority actions and the uncertainties of five government funding cycles of six months or one year duration.68 For each funding cycle, the OTI was told that it would be the last one.

Creation of the OTI action centre in 2004-2005 gave immediate expression to the clientele priority for creating industry networking opportunities through the Task Force concept (approximately 15 task forces in 2005). Short-term actions also included the on-site provision of career counselling and family services, and one-on-one intervention for long term unemployment that were leveraged through HRSDC’s federally-funded external Northern Lights Vocational Services (NLVS) and the YMCA. Initially, partnerships with these external
organizations delivered job search skills training such as resume writing, interviewing skills, facilitation skills, networking skills and consulting services as a career path. Later, with increased HRSDC funding in 2005, a more focused technology sector training approach was taken with reliance on qualified staff who were also peers to the unemployed high-tech workers. The observation is made by task force participants that job search and non-technical (soft) skills learned were applied and reinforced in concrete task force activities. With respect to technical skills, there was reliance on non-staff peers to deliver targeted industry skills training internally to over 900 participants in 2005. This included skills training such as HTML, preparation courses for Project Management certification, entrepreneurs (past clients) sharing experience on how to start a company, WiFi and WiMax theory and practice, XML landscape and the rapidly emerging technology, and defects in software products. This practice continues today and warrants elaboration.

The qualified individual wants to give back to the organization and to the community. This has been done in sessions such as HTML, Configuration Management, Linux and Project Management. The member identifies him/herself to OTI as an instructor or we publish the need for certain expertise on the website and in the newsletter. The course is then scheduled, published and delivered.

The Project Management Institute has signed an agreement with OTI (beginning in 2005) to provide course curriculum, certification of training hours and certification of instructor hours. This is a highly recognized accreditation in the industry and a great value as a certification on a resume to potential employers. There is a pool of instructors who are OTI members and very willing to teach the course.

The Universities and Colleges have delivered courses here at OTI. There were approached by OTI Program Directors in meetings and agreed to provide professors to teach courses from their course calendars. Some examples are “Disruptive Technologies” by the University of Ottawa and “Risk Management” from Carleton University’s Sprott School of Business.

Companies in the local area contribute training such as ITIL The IT Infrastructure Library, an industry best practice framework for IT Service management was taught by a training company, Windrose Management. They provided the training free of charge to give to the community. They also say the opportunity to connect with IT worker who would be evaluating and delivering ITIL training in their future employment. Another workshop on VoIP was delivered by Bell Security Systems.
All of the above were delivered free of charge.

French [language] training was delivered at a very reduced cost of $40 for 10 sessions. This would be about $700 as public training. The cost was reduced by the organization Fast Forward French to accommodate the clients who do not have employment. The course teaches to the Government requirements for bilingual grades.69

By 2006 then, the CAP commitments of career counselling and family support services and one-on-one intervention of long term unemployment had been met through external community-based employment services. These became internalized with career counselling services provided by the OTI Resources Advisor who is also charged with designing and implementing business and soft skills training events. Targeted technical skills training on a range of topics is provided by OTI members with technical expertise and accreditation, by universities and colleges in credit courses provided free, and by companies in the local area either at greatly reduced costs or offered free.

These training ‘events’ are continued in 2007 and delivered approximately 2-3 sessions on varying topics each month. The CAP commitment to Transition Training on Labour Market and Economic Data was not identified as a priority action for 2006 but a 3 day course on Labour Market Information was piloted by a government funded organization Information Technology Organization. In 2007 the session is provided once a month. Similarly, a high tech Co-op / Internship Program was not identified as an activity for 2006 but is a priority for 2007 and is in the planning stages at this time.

Finally, by addressing the CAP commitment to `identify skills and gaps of Technology workers interested in transition to other career areas’ in 2006, OTI took the first major steps in transforming itself to a more comprehensive local skills strategy, identifying the skills requirements of a rapidly changing technology market with those in supply by an unemployed high tech workforce. To determine what constitutes a ‘good fit’ between labour market skills demand and supply, the OTI completed a preliminary assessment of current skills in OTI’s database of clients and current demand from OTI employers.70 Specifically, a comparison is made of competencies extracted from 200+ job postings over three months (July-September
2006) and 24 generic supply profiles obtained from 1437 OTI client resumes, based on common job titles/classification and generic areas of expertise (common terminology). Three common, recurring and statistically significant skill components are extracted from employer requests – educational attainment, core technical skills, and non-technical, soft skills. These are then mapped against the skill sets derived from the OTI generic expertise profiles. Based upon this sample, there is no obvious skills mismatch between demand and supply. However, as the analysis suggested, this is likely the result of a highly skewed sample of job postings for high end jobs, requiring 7-10 years of work expertise and specific types/levels of qualifications. With few exceptions, the resumes in the OTI database reflect this target population - highly educated (BSc and higher), have years of job experience (7 – 10 + yrs) and are mature (predominantly over 35 years of age). The frequency of requests (job postings) for entry or intermediate positions received by OTI is low.

<table>
<thead>
<tr>
<th>Client Supply Profiles</th>
<th>Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Engineer</td>
<td>85</td>
</tr>
<tr>
<td>Software Engineering</td>
<td>68</td>
</tr>
<tr>
<td>Software Developer</td>
<td>110</td>
</tr>
<tr>
<td>Software Development</td>
<td>119</td>
</tr>
<tr>
<td>Hardware Engineer</td>
<td>12</td>
</tr>
<tr>
<td>Hardware Engineering</td>
<td>7</td>
</tr>
<tr>
<td>Hardware Technologist</td>
<td>3</td>
</tr>
<tr>
<td>Network Engineer</td>
<td>11</td>
</tr>
<tr>
<td>Network Engineering</td>
<td>12</td>
</tr>
<tr>
<td>Network Administrator</td>
<td>36</td>
</tr>
<tr>
<td>Network Administration</td>
<td>40</td>
</tr>
<tr>
<td>Network Analyst</td>
<td>3</td>
</tr>
<tr>
<td>Networking Analyst</td>
<td>0</td>
</tr>
<tr>
<td>Systems Analyst</td>
<td>47</td>
</tr>
<tr>
<td>Business Analyst</td>
<td>33</td>
</tr>
<tr>
<td>Programmer Analyst</td>
<td>66</td>
</tr>
<tr>
<td>Programming Analyst</td>
<td>0</td>
</tr>
<tr>
<td>Programmer</td>
<td>182</td>
</tr>
<tr>
<td>Web Designer</td>
<td>13</td>
</tr>
<tr>
<td>Web Design</td>
<td>41</td>
</tr>
<tr>
<td>Web Developer</td>
<td>37</td>
</tr>
<tr>
<td>Web Development</td>
<td>41</td>
</tr>
<tr>
<td>Project Manager</td>
<td>169</td>
</tr>
<tr>
<td>Project Management</td>
<td>302</td>
</tr>
</tbody>
</table>
From Unemployment to Sustainable Livelihoods in Ottawa’s Technology Sector

September 6, 2007

<table>
<thead>
<tr>
<th>Education</th>
<th>Demand</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor / BSc degree / P.Eng / B.Eng</td>
<td>40%</td>
<td>71%</td>
</tr>
<tr>
<td>MBA / MSC / Masters</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>College diploma</td>
<td>5%</td>
<td>51%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>4%</td>
<td>68%</td>
</tr>
</tbody>
</table>

Core technical skills include one or more specific competencies, e.g. 18% of all job requests required C++, in combination with others.

<table>
<thead>
<tr>
<th>Technical Skills</th>
<th>Demand</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>C++ (not Visual)</td>
<td>18%</td>
<td>64%</td>
</tr>
<tr>
<td>SQL (not MySQL, not my SQL)</td>
<td>15%</td>
<td>62%</td>
</tr>
<tr>
<td>Windows</td>
<td>14%</td>
<td>53%</td>
</tr>
<tr>
<td>Linux</td>
<td>13%</td>
<td>25%</td>
</tr>
<tr>
<td>Microsoft</td>
<td>9%</td>
<td>42%</td>
</tr>
<tr>
<td>Security</td>
<td>9%</td>
<td>42%</td>
</tr>
<tr>
<td>Java</td>
<td>9%</td>
<td>29%</td>
</tr>
<tr>
<td>UNIX</td>
<td>8%</td>
<td>40%</td>
</tr>
<tr>
<td>LAN/WAN/VLAN</td>
<td>8%</td>
<td>53%</td>
</tr>
<tr>
<td>.NET</td>
<td>8%</td>
<td>14%</td>
</tr>
<tr>
<td>Ethernet</td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>IT</td>
<td>7%</td>
<td>39%</td>
</tr>
<tr>
<td>SAP</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Security (not clearance)</td>
<td>2%</td>
<td>49%</td>
</tr>
<tr>
<td>HTML</td>
<td>4%</td>
<td>29%</td>
</tr>
<tr>
<td>ASP</td>
<td>4%</td>
<td>9%</td>
</tr>
<tr>
<td>VoIP</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>Javascript</td>
<td>4%</td>
<td>14%</td>
</tr>
<tr>
<td>XML</td>
<td>3%</td>
<td>17%</td>
</tr>
<tr>
<td>TCP/IP (TCP/UDP)</td>
<td>3%</td>
<td>56%</td>
</tr>
<tr>
<td>MySQL (my-SQL)</td>
<td>3%</td>
<td>47%</td>
</tr>
<tr>
<td>MCSE</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>ITIL</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Vbscript</td>
<td>1%</td>
<td>4%</td>
</tr>
<tr>
<td>Visual C++</td>
<td>1%</td>
<td>7%</td>
</tr>
<tr>
<td>PMP</td>
<td>1%</td>
<td>4%</td>
</tr>
<tr>
<td>ISS</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Web Application Designer Advanced Security</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>A+</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>
A number of observations can be made from these tables above. First, the basic educational requirement for jobs is high, with 40% stating a minimum of a BSc degree. Over 70% of OTI clients met this requirement. The second thing of note is that that core technical skills in demand are widely dispersed across the job postings, suggesting very technical-specific profiles. In contrast, the non-technical soft skills appear to be in strong demand across all jobs. In both of these skill areas, OTI clients appear to match up well, albeit the actual job-skill matches depend upon the many possible combinations of technical skills in demand and in supply and upon the fewer possible combinations of soft skills. The third observation is that, in addition to adding precision in identifying specific competencies and their combinations, further work is needed to determine the relative weighting of the technical and non-technical components in job requests in order to provide jobseekers with a clear understanding of their own skills availability and gaps. Employers are currently quoted as saying as much as 60% of focus is
placed on soft skills and 40% on technical skills which, in many quarters, are more easily taught and learned.\textsuperscript{71}

OTI staff independently observed the following characteristics of the tech workforce that don’t fit into the regular service programs but which inform the design of OTI services and programs:\textsuperscript{72}

- Highly educated population
- Advanced ability to grasp new concepts and technologies
- Self-directed and independent
- Unfamiliar with and untrusting of employment/unemployment support systems and methodologies
- Cynical about government-run support programs
- Accustomed to sophisticated work environments
- Unfamiliar with and not adept at social networking and ‘people skills’
- Logical and analytical to a fault
- Employment environment requires sophisticated understanding
- Unaccustomed to feeling helpless and not self-sufficient
- Eager to be exposed to new information and learning opportunities.

While this assessment has provided OTI with a clearer picture of the emerging skill requirements and clientele supply by 2006, it has also validated the evolving skills strategy developed over the years by OTI. This strategy started with immediate coping and job search skills training which, along with business and soft skills training, could practically be applied in collaborative task force networking activities. The strategy then extended to a widening range of technical skills training. In combination, a more rounded skill set was made possible at a very cost-effective way. The question here is whether this assessment is unique to the job and clientele samples used or whether it can be generalized. As the analysis recognizes, “employers’ job postings and demand are for mature, qualified, educated resources. This may not reflect “industry requirements” but are reflective of OTI specific client demographics.”\textsuperscript{73}

The final section of this case study considers the most current industry requirements and OTI’s continuing efforts to integrate skills demand and supply information for the benefit of the local high tech community and unemployed job seekers.
5. **From Unemployment to Sustainable Livelihoods**

**Issues and Options**

At the national level, a ‘Canadian IT Labour Market Initiative’ was developed as a partnership initiative between the Software Human Resource Council (now the Information and Communications Technology Council), the federal government through Human Resources and Skills Development Canada (HRSDC), and industry representatives. The purpose of the initiative was to gather and interpret labour market information pertinent to IT professionals. In June 2005, this sector council reported the conclusions and recommendations of its Expert Panel following the review of three recent research projects:

- The National Survey of IT Occupations by Morley Gunderson, Lee Jacobs and François Vaillancourt (April 2005),
- Trends in the Offshoring of IT Jobs by Prism Economics and Analysis (April 2004), and
- Recruiting, Retaining and Developing IT Staff by Ken Rifkin (March 2004).

In priority sequence, the Panel identified issues and options for:

1. Competencies
2. Technological change, globalization, outsourcing and offshoring
3. The big picture
4. Public perceptions and post-secondary enrolments
5. Career mobility, diversity and equality
6. Education, training and learning
7. IT and HR, especially in small and medium business
8. Competencies, multi-tasking and classifications
9. Regional differences.

While many of these issues are within OTI’s domain, two in particular are core to its mission and operations – competencies, education and training. The issue for competencies is that too
many high-tech workers “lack sufficient leadership, interpersonal and/or business management skills.” As one Industry member of the Expert Panel said, “Technology skills are just the table stakes”. In addition to technical skills, soft skills are now a major expectation of employers. The challenge is a serious and growing training gap between the skill upgrade goals of individuals and employers’ willingness to invest in upgrade training. Included among potential options put forward to address the competencies issue was the continued promotion and adoption of the Occupational Skills Profile Model as the Canadian IT occupational standard, and partnership with post-secondary institutions to integrate personal/interpersonal skills in their engineering and technology programs. Post-secondary educational institutions are specifically challenged to fill the significant competency gap by creating the ‘total package employee’ in its core technology programs. These issues are underscored in the ICTC’s March 2007 snapshot of the Canadian ICT labour market. It was pointed out that the supply of IT personnel is affected by an 11% decrease in university IT enrolment between 2002 and 2005 due in large part to the uncertainties created by the dotcom crash, the slump of major CT firms, and offshoring of jobs. At the same time, companies need to retain and retrain existing employees rather than to have revolving employees with slightly different skill sets.

While there have been active consultations and discussions on issue and options, what has yet to emerge for the national level deliberations is a clear strategy and action plan for a better organized and functioning high-tech labour market. However, from these deliberations, it seems certain considerations will figure prominently. A new occupational classification standard needs to be adopted to send strong signals on what the industry needs in skills. The high-tech skill sets need to be broaden to include non-technical ‘soft’ skills. Greater investment in skills upgrading and retooling must be made, and better recruitment and compensation HR services must be provided especially to small and medium-sized enterprises. There would appear to be an opportunity for some innovation that can deliver of these expectations.

Meeting the Future – OTI’s Proposal

The OTI is presently developing such a proposal that would, at the community level, address the critical skills shortage issue in the long term. The overall goal of the project is to enable
Ottawa’s high tech industry to effectively manage its human capital through an integrated human resources planning function and adjustment service. The project is outlined below:

The Human Resources Planning Services would have an experienced team of HR professionals working with each of the 1,800 high tech firms in Ottawa that do not have fully staffed HR departments to determine present and future labour needs. These individual company-specific HR plans would then be analyzed to create an overall labour force development plan by the Research, Analysis and Strategy Planning function. Through its Education and Training Services, the data would be disseminated to trainers and educational institutions to assist them to design and deliver appropriate courses and programs that will fill the defined skills gaps. Apart from these outreach activities, the new OTI would sharpen its Workplace Transition Services and Adjustment Services by matching clients to the labour demand information in assisting them to obtain sustainable employment.

The prospects for this depend upon the credibility of the OTI with the high-tech business sector in order to gain access to company data and hiring managers, and with potential government agencies to seed fund the initiative. In both cases, it would do well for the OTI to dovetail its proposal to the policy issues and options suggested by the ICTC industry-government partnership. In this case, the OTI proposal highlights the local dimension of resolving national issues. Indeed, it may be useful to work initially with a set of ‘shiny lights’ – a subset of firms in a particular thriving high-tech field such as photonics – as a demonstration project. Industry and government support are more likely on a project basis rather than an ongoing program.
Demonstration of success will enlarge the opportunity to widen the participation of the Ottawa high-tech sector.

**Conclusion**

The case study of the Ottawa Talent Initiative draws attention to a local community response to a major industry boom and bust cycle. During the high tech boom era of the late 1990’s, the main focus for skills requirements was technical ability. Severe skills shortages were identified in four of seven key industry clusters for Ottawa. When the dot-com bubble burst in 2001, unemployment grew and skills demand was increasingly short term and of temporary work contract nature, with job seekers cycling through periods of employment and unemployment. Employers at present report skills shortages and anticipated skill gaps while the current pool of unemployed technology workers has a broad set of skills and experience that is a perceived mismatch. Among the trends reported in the OTI update to OCRI’s 2006 TOPS report:

- A process of skills rationalization is occurring based on business productivity. Organizations are narrowing their focus to select groups of technologies and their corresponding skill sets. The skills in highest demand are generally attached to pervasive products and emerging technologies such as VoIP that business is looking to harness to leverage profitability.

- The rapid evolution of IT product and technologies entails that the IT professional continually re-skill in order to preserve their relevance. Critical for success and advancement, IT professionals must focus on both technical and business skills (developing and marketing business communication and interpersonal skills).77

For unemployed technology workers, OTI has been a centre for retooling technical skills but also for learning new non-technical strategic skills that could be integrated in task force employment search activities. Given the opportunity, the new OTI proposal could test the viability of an integrated industry human resources planning and adjustment service that would benefit the local economy and community.
EndNotes

1 Marc Frenette, Life After the High-tech Downturn: Permanent Layoffs and Earnings Losses of Displaced Workers, Business and Labour Market Analysis Division, Statistics Canada, Ottawa, July 2007: 1-29
2 Ibid.: 4.
7 Edward T. Jackson and Rahil Khan (June 2005), Steering on Black Ice: The Continuing Search for Sustainable Livelihoods in the Ottawa Tech Sector, Ottawa, Carleton University: 4, prepared as a chapter for Remy Tremblay (ed.) Ottawa in the Age of the New Economy
9 Using a different methodology, the same conclusion was reached by Laila Gulzar (April 2006), Boom and Bust of Information and Communication Technology and Thereafter, an essay submitted to Carleton University toward the degree of Bachelor of Arts with Honours in Economics, Ottawa.
11 Ibid., 9
12 See for example the comments of Professor Daniel Traca from the Solvay Business School, as a discussant to Freeman’s presentation “Doubling the Global Workforce and Human Resource Leapfrogging: the Policy Challenge”, Bruegel Economic Policy Seminar, Brussels, 12 September 2006
14 The 14 LEED Local Skills Strategies case studies include the Mackay Area Industry Network (Australia), Griffith immigrant pathways (Australia), Ottawa Talent Initiative (Canada), Shanghai Municipal Government human capital development (China), Gandia CSI-COM, Valencia (Spain), London Development Agency (UK), South Lincolnshire regional labour strategy (UK), Choctaw Tribe of Mississippi (US), Michigan Skills Alliances (US), Zacatecas migrant-government-business partnership (Mexico), Bragança knowledge economy strategy (Portugal), Neamt-Kulturkontakt education partnership (Romania), St. Petersburg and Leningrad Oblast (Russia), and Kiev/Odessa youth labour exchange (Ukraine).
15 I wish to acknowledge the invaluable contributions of Mr. Shane Gallagher, Mr. Howard Yeung, Ms. Irene Andayo and Ms. Annie Song. Their written materials are incorporated in the annex.
17 Ibid.: 4
18 Anita Caputo and Lee Wallace (September 2006), *Dreams that Boomed after the High Tech Bust: The Human Experience of Getting Through Unemployment*, unpublished manuscript: 2, 10
19 Provided to the author by the Doyletech Corporation upon request. For a discussion and introduction of the 2005 version of the Family Tree of Ottawa-Gatineau High Technology companies, see Doyletech Corporation (March 2005), *The Ottawa Technology Cluster Past, Present and Future*, Presented to the OCRI Showcase.
20 Chris Sewell (October 22, 2001), “When Boom Goes Bust”, in *TelephonyOnline*
21 Catherine Chamberlain Attfield, quoted in Kate Heartfield (2003), “On a Mission”, *The Ottawa Citizen*
22 Bowly, *ibid.*: 15, and Bowly and Langlois: 15
24 The single known study of the intersection of immigration and the technology sector is an excellent working paper by Peter V. Hall (2006), *The Labour Market Situation of Highly Skilled Immigrants in Canada’s Hi-Tech Clusters*, Working Paper 2006 D-18 in the Human Resources and Social Development Canada (HRSDC), Industry Canada (IC) and the Social Sciences and Humanities Research Council Initiative on the New Economy (SSHRC-INE).
26 Edward T. Jackson and Rahil Khan (June 2005), *Steering on Black Ice: The Continuing Search for Sustainable Livelihoods in the Ottawa Tech Sector*, unpublished manuscript prepared as a chapter in Remy Tremblay (ed.), *Ottawa in the Age of the New Economy*, University of Toronto Press, forthcoming: 3
27 Seen to put a ‘bright light’ on everything, OCRI’s positive slant on the state of high-tech employment was partly motivated by city boosterism and the desire to attract new businesses. For the latest commentary on the different employment numbers, see James Bagnall (January 16, 2007), “Building a boom in Ottawa: OCRI says the tech recession is over; it just isn’t so”, in *The Ottawa Citizen*. See also James Bagnall and Andrew Mayeda (July 31, 2006), “Behind the Numbers”, *The Ottawa Citizen*.
28 Chris Sewell (October 22, 2001), *ibid.*
29 Kristin Goff (November 7, 2002), “Ottawa’s Second Coming”, in *The Ottawa Citizen*.
30 Darch interview, *ibid.*
31 Caputo and Wallace, *ibid.*: 10
32 Interview with Michael Darch, Executive Director, Global Marketing, OCRI, March 16, 2007
33 Morley Gunderson, Lee Jacobs and François Vaillancourt (April 2005), *The Information Technology (IT) Labour Market in Canada: Results from the National Survey of IT Occupations*. Software Human Resource Council: 51
35 Caputo and Wallace (2006), *ibid.*: 85-86
36 Dave Sproule, quoted in Kate Heartfield (2003), “On a Mission”, *The Ottawa Citizen*
37 Warren Szkolnicki, quoted in Kate Heartfield, *ibid.*
38 *ibid.*: 153
39 Key informant interview with Peggy Feltmate (23 March 2007)
40 Peggy Feltmate by this time had been elected to the City of Ottawa Council and had asked the manager of economic development to “go where the energy is”. Key informant interview with Michael Murr, City of Ottawa (30 March 2007)
41 Key informant interview with Cheryl Gorman, formerly OCRI (23 March 2007).
42 Presently called the Ontario Adjustment Advisory Program (AAP) which “works with employers, employees and communities to develop strategies to cope with company downsizing or plant closures”. For a program description, see http://www.edu.gov.on.ca/eng/tcu/employees/aap.html
43 Key informant interview with Paul DeLatt, Ontario Adjustment Service
44 *ibid.* Also referenced in the context of MTCU approaching and wanting to work with OCRI TalentWorks on downsizing adjustment in key informant interview with Cheryl Gorman, formerly executive director of TalentWorks and founding member of OTI.
46 The Ottawa Partnership (August 2000), *Choosing a Future: A New Economic Vision for Ottawa* 
47 *Ibid.*: 1-14
48 I am grateful to Cheryl Gorman for drawing my attention to this diagnosis and prognosis of the skills requirement in the Ottawa high tech sector in her 2003 Talent Plan that informed the medium-term 20/20 talent plan for the City of Ottawa.
49 Key informant interview with Michael Murr, City of Ottawa. Interestingly, this is one of the first community/sectoral adjustment project for the Ontario Adjustment Service which specialized in company-specific downward adjustment of labour. Key informant interview with Paul DeLaat.
51 See ANNEX B: Community Action Plan 
52 ANNEX B: Community Action Plan 
54 Payments were in actuals based on claims against advances every two months. Key informant interview with Paul DeLaat, Ontario Adjustment Service
55 Key informant interview with Joe Stelliga.
56 Key informant interview with Marianne Wilkinson.
57 Key informant interview with Jim McQuaid.
58 Key informant interview with Marianne Wilkinson.
59 Key informant interview with Patrick Donnelly, Ontario Ministry of Training, Colleges and Universities, former manager of the Adjustment Service
60 These include Mauril Bélanger, chair of the Eastern Ontario Caucus of the Liberal federal government, David McGuinty, Ottawa Member of Parliament and former President and CEO of the Prime Minister’s National Round Table on the Environment and the Economy (NRTEE), Marlene Catterall, Ottawa Member of Parliament and former Chief Government Whip, and senior officials from Human Resources Development Canada. Key informant interview with Marianne Wilkinson.
61 Key informant interview with Cheryl Gorman, formerly OCRI. The purpose of the performance metrics she developed for TalentWorks was to assess its impact on Ottawa jobseekers and employers, including access to relevant workforce information. The metrics included both leading and lagging indicators.
62 Leo Valiquette (22 November 2006) “Ottawa Talent Initiative’s Action Centre Shuts Down as Funding Ends” in ITbusiness.ca, and Bert Hill (22 November 2006), “Clients, staff defend tech placement agency”, in *The Ottawa Citizen*
63 Discussions with Gary Davis, Executive Director of the OTI, and Paul DeLaat in his key informant interview. 
65 Robert O. Brinkerhoff (2003), *Ibid.* 75-95
66 Non-success case interview 1 (13 May 2007).
67 I am grateful to Neil Frenkel for drawing my attention to this priority-setting principle.
69 Description of the OTI training model by Linda Last, OTI program director, in email 20 June 2007.
70 Jacque Benjamin, 1st *Level Assessment - Demand and Supply Results for OTI Client Demographics*, OTI, September 22, 2006.
71 A note on *Soft Skills Training at OTI* by Tina Bennett, sent by email 25 June 2007.
72 Tina Bennett, OTI client profile email to author, 7 August 2007
73 *Ibid.*., p.2
74 Software Human Resource Council, Expert Panel (June 2005), *Canada’s Information Technology Labour Market, 2005: Issues and Options*
75 Information and Communications Technology Council (March 2007), *Current Snapshot of the Canadian ICT Labour Market*. 
76 Key informant interview with Keith Carter (30 March 2007)
77 Jacquie Benjamin, OTI update to TOPS report document, 17 November 2006